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USSR Report

TRANSPORTATION

No. 23



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MOTOR VEHICLE

RSFSR DEPUTY MINISTER OF ROADS EVALUATES REPUBLIC'S ROADS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Aug 80 p 2

[Article by A. Nadezhko, RSFSR Deputy Minister of Roads: "Everyone Needs Roads"]

[Text] There is an old saying that it is the road, not the horse, that moves you. Scientists and economists think that development of a road network is one of the vital factors determining the entire national economy's rate of development. And, road construction is advantageous. Each ruble so invested is recouped four-fold.

We build a great deal. During the past decade alone, the length of roads with an improved surface increased by a factor of more than 2. The road construction tasks set forth by the 25th CPSU Congress and the State Economic and Social Development Plan for 1976-1980 successfully are being accomplished. Work rates and volumes are increasing and labor productivity rose each year in the Russian Federation, where subunits of our ministry are laboring. Thus, 43,000 kilometers of road were built by workers and employees, whose numbers practically speaking remained unchanged, during the 9th Five-Year Plan, and at least 48,000 kilometers will be built during this five-year plan.

The picture, as we see, is completely favorable, if you evaluate accomplishments from the sector's point of view. But, what about from the state's point of view? We turn to the CPSU Central Committee and USSR Council of Ministers decree passed recently "On Measures to Improve the Construction, Repair, and Maintenance of the Country's Roads." Stated directly here is that the road network's rate of development noticeably lags behind the requirements of the national economy.

Thus, the upcoming five-year plan will assign road builders a much more difficult task than is now assigned. Ahead in the next 5 years, as stated in the decree, is construction of 80,000 kilometers of road. And, road builders can only count upon the forces they now possess. This means that the only course is to seek additional reserves for increasing labor productivity.

Where do you look? First off, in the area where we are in a position to help ourselves, it goes without saying--by improving the forms of labor organization and construction management, by widespread introduction of the brigade contract. Our capabilities in this area are far from exhausted. For example, we presently have few integrated contract brigades of road builders and vehicle drivers, although the work know-how of those we do have--and there about 100--demonstrated that output here is increasing approximately by a factor of 2. Our economic and engineering services also would do well to examine carefully the know-how of the builders in Vinnitsa from the UkSSR Ministry of Industrial Construction. An original and very effective methodology is used there in production and engineering planning and assembling the material resources for a reinforced integrated contract brigade, which assumes the responsibility for work progress at the site from the very outset until completion and turnover for operation. There also are other examples where our subunits lag in the organizational area behind the country's leading collectives.

However, a further increase in the rates at which roads are built greatly depends also on the technical level of road-building machinery and supply of materials.

During the 11th Five-Year Plan, approximately 330 million cubic meters of gravel, including more than 50 million of high-impact gravel, will be needed in the RSFSR for construction of new and reconstruction of present highways. We continually experience lapses in the supply of gravel, even though the ministry has its own quarries and rock-crushing plants. There is no way to supply builders the required amount of high-impact gravel, even taking maximum development of plant capacities into consideration. There will be an annual shortage of 5 to 6 million cubic meters.

Meanwhile, the USSR Minstroyaterialov [Ministry of Construction Materials Industry]--the country's leading supplier of nonmetallic minerals-- is developing capacities for their extraction and processing at insufficient rates. Therefore, the majority of consumers will try to obtain needed non-metallic materials through their own means. This will lead to an upsurge of a multitude of dwarf departmental quarries. Thus, the Zhirnov Limestone Deposits in Rostovskaya Oblast are being developed by enterprises from five ministries--the all-union Minenergo [Ministry of Energy], Minchermet [Ministry of Ferrous Metallurgy], and MPS [Ministry of Railways] and the republican Minstroyaterialov and Minavtodor [Ministry of Roads]. Comparison of two figures is sufficient to answer the question to whom development of gravel production is economically most advantageous. Annually, Minstroyaterialov extracts more than 6.5 million cubic meters, while Minavtodor extracts less than 500 thousand. There is no need to prove the advantages and profitability of large-scale productions with a high level of mechanization.

There are many examples where the cement industry undermines road builders. Periods and volumes of shipments are not maintained. Here is one example. Our subunits receive only 94.3 percent of the amount of binder allocated based on funding during the first half of this year. Arrhythmic supply of basic construction materials reduces work tempos at any construction site.

This also leads to a reduction in quality at several sites, where the process of pouring concrete must be uninterrupted. Roads built using the "Avtogreyd" complexes also fall into the latter category.

Anyone who travels a lot certainly has observed how the row of modern vehicles, leaving behind a wide concrete cement strip smooth as a table top, moves along the roadway under construction.

These are "Avtogreyd" or "DS-110" complexes in operation. Their daily productivity is up to 1.5 kilometers of first-class surface. This equipment meets all requirements of the time! But, it is certainly not being operated to anywhere near its full capacity: the machinery doing the excavation work during the first stage of the construction is too weak. There are about 50,000 units within the RSFSR Minavtodor. But, units are certainly not complexes. Excavators with small-volume buckets, low-capacity bulldozers on the DT-75 tractor chassis, 3-cubic meter scrapers, weak DS-74 tillers, light DZ-99 graders--this is the main inventory in the fleet.

The necessity to supply road builders modern, highly-productive equipment was stated in the "Main Trends in Development of the USSR National Economy for 1976-1980." We now only can dream about vehicles with great unit capacity, which several times over increase labor productivity, about interlinked systems and complexes. The documents of the 25th CPSU Congress and party and governmental decrees on road construction assigned Minstroydormash [Ministry of Construction, Road, and Municipal Machine Building] very specific tasks on development of the production of modern road-building equipment. And, the ministry in no way is avoiding their accomplishment. The Bryansk Road Building Machinery Plant and Minstroydormash, to which it is subordinate, are prepared to expand production of "Avtogreyd" complexes, as well as of other sets of equipment for road construction. But, everything comes down to making up the set. Attempts by Minstroydormash to obtain the requisite number of compact and powerful diesels from the Yaroslavl' Engine Plant, hydraulic drives, and other necessary components and units encounters resistance from the associated ministries--Minavtoprom [Ministry of the Automotive Industry], Minaviaprom [Ministry of the Aviation Industry], Minpribor [Ministry of Instrument Making, Automation Equipment, and Control Systems], and Minsel'khoz mash [Ministry of Tractor and Agricultural Machine Building]. Minstroydormash, first please justify the design advantages of the required diesels and units for use in construction machinery. The purpose would seem favorable: to avoid the possible consequences of charges of poor quality, of poor operating reliability. But, a simple fact is overlooked here: In order to test an engine, let's say, you first must have it, as a minimum.

Today, the length of the country's roads is approximately 1.5 million kilometers. The guarantee of reliable maintenance of this system--repair and marking the roadways, barriers, and other installations--requires a large amount of special machinery and devices. But, industry almost is not manufacturing such equipment. Sixteen RSFSR Minavtodor repair plants and another two-three dozen such enterprises in other union republics are attempting to the best of their ability to satisfy the hunger for

this equipment. But, the road ministries' "own" machine building effort is not capable of satisfying even the operating services' most vital requirements. This is not surprising: these repair plants have total capabilities that are much more modest than those of a specialized machine building ministry.

And, is it reasonable overall to set accelerated rates for development of a "physical establishment" within the sector? Today, we work for Minstroydormash. We are beginning already to replace Minpribor in some ways, as we create our own mobile laboratories, which are capable of determining, on the move, the quality of a road under construction, the condition of the surface of an existing road, and so on. But, we simply are not in a position to organize the production of nitroepoxy enamels and thermoplastic (these are the most effective materials for marking roadways). Minkhimprom [Ministry of the Chemical Industry] still only supplies one-fifth of our requirements for these products.

The 25th CPSU Congress listed the requirement to use the program-goal method widely in planning and to develop integrated programs for the most important scientific-technical, economic, and social problems among the vital problems of improving the economic mechanism. In our view, the construction and operation of roads also is one such problem. As can be seen from the CPSU Central Committee and USSR Council of Ministers decrees on problems of road construction and operation, organizations and institutions in more than 20 ministries and departments must participate actively in its solution.

As regards road builders, they more widely are expanding the competition for a worthy greeting for the 26th CPSU Congress and are taking all measures to successfully accomplish the tasks of the new five-year plan.

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RAILROAD

PARTY'S ROLE IN MANAGING RAILROADS HIGHLIGHTED

Moscow GUDOK in Russian 29 Jul 80 p 3

[Article by N. Pivovarov, Secretary of the CPSU obkom, Rostov-on-Don:
"On Key Items"]

[Text] An urgent socialist competition for fulfilling the tasks for the five-year plan is expanding at industrial and transport enterprises in our oblast. Exacting examination of what has been done is on-going within the party organizations, and measures are being taken to eliminate detected shortcomings. All work of Communists has the goal of having each collective meet the next congress of our own Communist Party with significant gifts of labor.

Comrade L. I. Brezhnev called transport one of the key sectors of the economy. Today the fate of the plans and high socialist commitments of many enterprises depends in many ways on the reliability of the railroad operation. The Rostov obkom devotes the most constant attention to development of the oblast's rail services and to timely and precise implementation of party and governmental decisions on more smoothly satisfying the national economy's transportation needs.

Special emphasis has been made to improve the rates for developing the capacity and processing ability of stations and terminals in the Rostov, Sal'skoye and Likhovskoye divisions of the Northern Caucasus and South-Eastern railroads, to refine the planning for operation of all types of transport, to decrease time expenditures for loading and unloading, to reduce empty hauls for rolling stock and to eliminate excessively lengthy and other types of inefficient transportation. None of these questions are removed from the agendas of the party's Bureau of Urban and Regional Committees.

The oblast operations staff for monitoring the use of rolling stock is functioning actively. Following the process of unloading and loading, it conducts selective conferences weekly. The secretaries of urban and regional party committees, deputy chairmen of urban and regional ispoikoms and chairmen of people's control committees participate in them.

The staff has conducted seminars and schools for the managers and workers of transport shops at enterprises and organizations where the rules for shipping various types of cargoes and advanced methods for car utilization were studied. With the cooperation of the staff of more than 450 of the oblast's enterprises, we concluded an agreement for collaboration and intersectorial socialist competition for acceleration of car turn-around time and loading operations with the stations' collectives. The collectives of the Rostov division and the "Rostovugol" production association and of the Likhovskoye division and the Belokalitvenskiy metallurgical plant have achieved significant successes under this agreement.

The miners and metallurgists are developing their own transport industry. Diesel locomotive power has been incorporated on the sidings, obsolete loading and unloading equipment is being replaced with more powerful equipment and heavier rail types are being laid on the line. Unified shifts have been established among related industries. As a result, just this year car idle time on sidings has been reduced by 0.1 hour and the static load increased by 0.3 tons. Aiding the railroad workers, the related industry enterprises repaired more than 300 cars. For the first quarter, the collective of the "Rostovugol" association was awarded the challenge banner of the CPSU obkom, the oblispolkom, the oblssovprof [oblast council of trade unions] and the VLKSM [Leninist Young Communist League] for effective use of rolling stock.

The bureau of the obkom worked out a precise system for monitoring the interaction of all types of transport. The example of the Leningraders found heated support in collectives of the Rostov, Ust'-Donetsk, Volgodonskiy and Azovskiy transport terminals. Railroad workers and truckers at the Rostov-freight, Zapadnyy [Western] and Millerovo stations are employing it creatively. Coordinating groups are working at all stations. The incorporation of uninterrupted schedule plans permitted us to reduce the idle time for ships being processed by 3 percent, for truck transport by 2 percent and for rail cars by almost 7 percent last year. However, despite some success we have not as yet achieved precision in the centralized dispatching of freight in the Rostov and Sal'skoye divisions. Procedures developed by plan for the work of station shifts and brigades of loading hands and truckers in Taganrog, Sal'sk and elsewhere is being disrupted.

Applying the experience of the Muscovites--as endorsed by the CPSU Central Committee--is one of the important ways to accelerate traffic. There is no need to demonstrate the advantage offered by freight trains of above-normal length and weight under our conditions. More than 4,000 such trains have already been moved over the Rostov and Likhovskoye divisions' lines. About 1 million supplemental tons of freight have been conveyed in them. But this is what puts us on the alert. The collectives at large stations--even such as Bataysk and Likhaya--are in fact not ready as yet to handle the mass passage of extra-long trains. There are no firm schedules for their movement, no developed technology for passing them on to the railroads' neighboring lines and precise interaction with freight consignees has not been set up.

Party and trade union organizations must take control of applying the experience of the Leningraders and Muscovites.

We consider the "Work without the laggards" movement, which was born in the oblast's industrial sector, to be an efficient means for improving transport effectiveness. This movement has been highly praised by Comrade L. I. Brezhnev. They have picked this up and are developing it in collectives of the Rostov and Sal'skoye divisions, but it has not as yet achieved the needed scope.

The CPSU Central Committee's decree "On Measures for Improving Party-Political Work in Rail Transport" has elicited vigorous response from Communists and all workers on the Don's steel lines. In implementing it, the obkom is elevating the role of party organizations in every way possible, particularly at the major terminals. Councils of party organization secretaries have already been created at the Rostov, Volgodonskoye and Taganrog terminals. The possibility of forming terminal party committees is being studied in Bataysk, Sal'sk, Taganrog, Kamenolomni and Millerovo.

The party groups which have been newly created in shift collectives, at technical inspection sites, container yards and in other subdivisions have become the organizers of a comprehensive competition among workers at the Rostov freight station, the section's loading and unloading operations, the municipal freight station, the truck depot and the transport shops of industrial enterprises. There has already been one effect of their activity: idle time for rail cars at the station has been reduced by 0.3 hour in comparison with the assigned time. We have economized by more than 1,500 cars since the start of the year--just by increasing cargo capacity.

The various commissions of party committees and party bureaus controlling the activity of the administration, the incorporation of new equipment and progressive technology and the use of rolling stock are also producing a good output.

The CPSU Central Committee's decree directs us to improve work in selecting cadres, ordering party forces and strengthening the most important links and the critical sectors of production with communists. The party strata among workers in rail transport on the Don is 15.8 percent, almost twice the rate in industry. At the same time, in such responsible sectors as, let us say, track maintenance, there are only 3.6 percent communists in all, 7.3 percent in the conductor reserves and 12 percent among rolling stock repair mechanics.

We are faced with improving the training and assignment of supervising cadres in the oblast's transport subdivisions. For now, each fifth person holding an engineer's position has no specialized education, and at the same time, there is an adequate number of specialists. For example, in the Likhovskoye division only 53.1 percent of the engineer positions are filled by persons with a higher education. In recent years 49 commanders have

been removed from the positions they occupied by higher party and operational bodies for negligence, misuse of their position and violations of discipline. There are many instances when workers without the necessary business qualifications and adequate initiative are advanced to supervisory positions. Four station masters have been replaced at such an important station as Batayak in recent years. Communists have drawn the correct conclusion from this. The party organization took the improvement of the business qualifications of command personnel under control. By promoting energetic, creative workers with initiative, the party committee plans to use them to create the necessary conditions for further growth.

The residential-domestic question is directly linked with the problem of cadres. As before, there remain long lines of people seeking to improve living conditions and there are not enough places in children's pre-school institutions at transport enterprises. Construction is not going satisfactorily. I am not without proof. The trust "Sevkavtransstroy" submitted an 18-apartment residence at the Vasil'yevo-Petrovskoye for 1 January 1980, but they postponed construction of the electric substation projected for here for the indeterminate future. As a result, the building is without electricity, and it is solely for this reason that it is unoccupied. This same trust is to submit a 49-apartment building for occupancy during the fourth quarter of this year in Volgodonskaya (Oblast). Its cost is R 450,000, but scarcely R 25,000 have been utilized. The future residents will hardly receive it on time.

The builders of the roadbuilding trust in Severo-Kavkazskaya are not acting any better. In the second quarter they frustrated submission of a 70-apartment building for tenancy at the Kamenolomni station. The domestic building of the locomotive depot in Sal'sk is on their conscience. It is scheduled for submission during the third quarter, and they have utilized less than half of the R 123,000 allocated. In Zverevo the railroad workers in no way wait out their new 300-person club. Finally, 5 years ago (!) the road building trust took out a mortgage for a 444-place dorm in Bataysk for their own workers, and...construction has "been frozen". This year R 130,000, which have not been utilized, have been newly released for its continuation. The management of the Rostov division decided to build the building with their people. This would be commendable, but at delivery sites for the fourth quarter of this year--at the 16-apartment building in Gornaya--work has not started at all, and only 12 percent of the released capital has been utilized at the 32-apartment building in Bataysk.

All of this indicates that the party organizations for transport construction subdivisions are not questioning management with authority about negligence in such an important matter as housing construction. We must still bring about order here.

The decisions of the June plenum of the CPSU Central Committee and the decree of the party's central committee "On Socialist Competition to Meet the 26th Party Congress in Worthy Fashion" inspire each Soviet man to great, patriotic feats. We have every reason to hope that the plans for the concluding year

of the five-year plan, the lofty socialist commitments made by the workers in industry, agriculture and construction in Rostovskaya Oblast will not only be fulfilled, but overfulfilled. It is the duty of communists in transport, of each railroad worker to do everything so that the necessary raw materials, materials, machinery and equipment be delivered to plants, construction sites and kolхоз fields in timely fashion, and that the products produced at oblast enterprises reach consumers quickly and without losses.

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RAILROAD

DIESEL LOCOMOTIVES SEEN AS ENERGY EFFICIENT

Moscow OUDOK in Russian 16 Jul 80 p 2

[Article by A. Chul'kov, senior scientific associate, Omsk Institute of Railroad Transport Engineers: "The Diesel--Reserves for Fuel Savings"]

[Text] Is the diesel locomotive economical? Scientists at the Omsk Institute of Railroad Transport Engineers have indirectly answered this question. They began to study problems with reliability of diesel locomotives, their repair and operation as early as 1965. Three years later, associates of the department of "Diesel locomotives and Diesel Locomotive Services" discovered a topic which is directly connected with economical operation of diesel rolling stock.

The first tests were conducted on the TEP60 by a group of research workers comprising engineers V. Gul'tyayev, V. Dankovtsev and doctor of technical sciences Ye. Pavlovich. The methodology was worked out and equipment for automatically recording fuel consumption and the parameters for diesel locomotive performance were manufactured. Specific recommendations for locomotive brigades were compiled, based on the results of the experimental trips. Even their incomplete incorporation permitted the efficiency of passenger diesel locomotives to be noticeably improved.

The experience they gained enabled scientists at the institute to undertake similar work for freight locomotives and switch engines. A comprehensive program for investigating the efficiency of diesel locomotives was developed under the direction of Prof. V. Chetvergov.

Adjustment of the diesel locomotives' performance was the most complicated element. Technical diagnostic stations were needed but there were none at the depots. Uneven load on a diesel's cylinders causes as much as a 25 percent power loss--up to 30 percent loss in the units of a single diesel locomotive. With this "truncated" power, the engine will not generate optimum power. The loss is two-fold in this case. The engineer, be he thrice an expert, cannot keep himself within the norms for fuel consumption: A 20-percent difference in load among the sections of a TE3 results in excess fuel consumption of 8 Kg/hr. and in the TE116 it is as much as 11.

In 1976 we began to study specifically the optimum operating modes for the ZTE diesel locomotives at Karsauk depot. The experimental trains showed that most often the engineers operate the trains using positions Nos 10-14 on the controls, whereas during "holisting" overhauls the diesel-generator installation is adjusted at the 16th position. This position is almost never used during a trip.

It was proposed to change the fuel injection advance angle to coordinate the actual operating mode of the diesel locomotives with the most economical mode. This job is not complex, requires no special expenditures and can be performed at any planned overhaul. Having secured the agreement of the heads of the depots and the railroad's locomotive services, we modernized one diesel locomotive and began to verify our calculations. A year of experimental operation showed that this engine consumed almost 1.5 percent less fuel in comparison with the control locomotives. We therefore decided to expand the experiment: 10 diesel locomotives which had been modernized according to the institute's plan began to pull trains. Presently all locomotives "on the hoist" at Karsauk depot are being adjusted to the new settings. The savings from incorporation of the innovation is R 350 per year per locomotive.

The comprehensive program for improving diesel locomotive efficiency required analysis of operating modes and of auxiliary machinery. Results of studies of the ZTE116 showed that in the fall-winter period, switching off the two blowers permits a fuel savings of up to 0.3 kg/hr with the control in the 10-11th positions, and up to 0.8 kg/hr in the 13th. Neither we, workers at the institute, nor the engineers are embarrassed by such modest figures, for tons are made up of grams.

Adjustment of a diesel locomotive's traction performance and efficiency of electric transmission are two of the main factors influencing fuel consumption. V. Paramzin, I. Senkevich, L. Ustyugov and S. Dolzhanikov, associates in our department, studied this problem. I will note only one detail: incorporating the recommendations developed by this group to improve the anti-slipage devices on the ZTE10L locomotives permitted fuel consumption to be reduced by 3-4 percent.

For a long time it was considered difficult to search for fuel economy reserves during switching operations (operating conditions vary by the second), and, it would seem, it is impossible to predict the load on a diesel switch engine. But if one were to analyze specific situations? We concluded an agreement with the Omsk Locomotive Depot and began our research. The first question was, "how does the quality of repair and service work affect the efficiency of the machinery?" The second concerned the influence of the organization of switching operations. It became immediately apparent that the attitude of mechanics to reconditioning switch engines is not at all the same as toward locomotives used on the mainline. The power was 10-15 percent below that on the rating plate on three machines we inspected. One of them had just arrived after repair in the Barnaul depot where, as was later learned, there is no rheostat testing station to adjust its power output.

During tests at the depot we established that the diesel motors on a switch engine are adjusted for near-maximum load, and they are used at that level no more than 5-10 percent of the total work time. The loads are significantly less on the whole, by half and even two-thirds of that on the rating plate. At such a setting, fuel is used too fast. Well, fine, the diesel operators retorted, we'll set the units for half loads, then there will be excessive fuel consumption during high-power operation. Let it be so! How many such high-power minutes are there in a shift? Very few. In sum, there will be a savings nevertheless if the machine is operating under its "own" conditions 90 percent of the time and under "unfavorable" conditions the other 10 percent.

Another detail. The Luninakiy method for servicing locomotives received the widest dissemination previously in switching. But concern for the technical status of a piece of machinery is also directly associated with problems of its efficiency. Two of the three diesel locomotives we tested worked with assigned brigades; the third was a replacement and did not have its own masters. Thus it turned out that fuel consumption of this replacement unit was 8-10 percent higher.

When establishing norms for fuel consumption, it is considered that a diesel locomotive compressor should work one-fourth as much as the diesel motor. Our research performed on the Western Siberian and Sverdlovsk Railroads showed that compressors operate 34 percent of the time. This means an "extra" 12 kg of fuel per day for each locomotive. Is "some 12 kg" a trifle? No! Because this is as much as 500 tons per year for a single depot.

As is known, an electric locomotive does not consume electricity when standing. But the diesel motor of a diesel locomotive is not turned off. Consider 25 kg of fuel lost for every half hour it runs on idle. And the total time for unanticipated delays on the individual lines numbers in the thousands of hours!

Rail transport consumes more than 18 percent of the diesel fuel produced in the country. It is a point of honor for each rail worker to see to it that not a single kilogram of this enormous river of fuel is wasted. And here there is something for all of us--engineers and mechanics, dispatchers and track workers, communications workers and car inspectors--to think about. A great role in improving diesel locomotive efficiency also belongs to transportation science. We have the resources and the capabilities as well as the experience to look deeper and more broadly into this problem and to solve it comprehensively as the decisions of the June (1980) plenum of the C U Central Committee instruct us to do. In his appearance at this plenum, Comrade L. I. Brezhnev correctly noted that there is still scope for improving efficiency and labor quality at each enterprise. It should be a matter of honor for us to do this as quickly as possible.

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CSO: 1829

RAILROAD

REPAIR OF LOCOMOTIVES DISCUSSED

Deputy Railroad Minister

Moscow ZHELEZNODOROZHNIY TRANSPORT in Russian No 6, Jun 80 pp 5-13

[Article by A. T. Golovatyy, Deputy Railroad Minister, Chief of the Main Administration for Repair of Rolling Stock and Spare Parts, Ministry of Transportation: "Factory Locomotive Repair: Experience and Problems"]

[Text] Locomotive repair plants and plants producing spare parts play an important role in the solution of the main problem of rail transport: supplying the country's total need for freight and passenger transportation. These plants insure that the railroad's locomotive fleet is kept in good repair. Major overhauls, intermediate overhauls and modernization of electric locomotives, diesel locomotives and electric trains, as well as repair of wheel pairs, electric machinery, diesel motors and other equipment are performed at MPS [Ministry of Transportation] repair plants, and spare parts are manufactured to provide factory repair and locomotive maintenance at depots.

Increasing rail freight turnaround, the constant replenishment and renewal of the locomotive fleet and the increased intensity of its operation require the further growth of production capabilities at MPS plants, an increase in the quality and efficiency of repair and the growth of spare parts production. A broad program for developing the MPS factory repair facilities has been planned in the decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures for the Development of Rail Transport in the Years 1976-1980."

In March 1979, a conference of party committee secretaries and heads of MPS plants was held at the CPSU Central Committee. Practical problems concerning further strengthening the material and equipment base of repair enterprises, the more complete use of available facilities, improvement of the quality of rolling stock repair and increasing the production of spare parts were discussed at the conference along with questions concerning acceleration of the renovation of existing plants and construction of new ones. Much attention was devoted to the training and assignment of

decrees and to strengthening the political and educational work in production collectives. In accordance with the decrees and the questions discussed at the conference, concrete measures were planned within each plant collective and commitments for rolling stock repair and spare parts manufacture beyond the plan were accepted.

The growth in volume and the improvement in the quality of repair work is inextricably bound to refinement of the economic operation and the search for new and more progressive forms of management and administration. At the NPS plants, this important work is being conducted on the basis of the CPSU Central Committee and USSR Council of Ministers decree "On Improving Planning and Strengthening the Effect of the Management Mechanism on Improving Production Efficiency and Work Quality." Proposals concerning questions of planning the most important indicators for plants, improving the effectiveness of material stimulation and the formation of incentive funds have been worked out and submitted for confirmation. New wholesale price projects are being prepared and net output quotas are being calculated.

Achievements and Resources

Factory repair occupies an important place in the locomotive preventive maintenance system. Repair work, reconditioning and replacement of major locomotive assemblies and units are performed at the plants. Thus during factory repair of diesel locomotives, many of the most important diesel engine parts, the motor axle bearings and all ball bearings are replaced. During major overhaul of both diesel locomotives and electric rolling stock, the high-voltage and low-voltage wiring is also replaced. As a result, electric and diesel locomotives emerge from factory overhauls restored to a significant extent.

Beside repair, a high volume of modernization of the locomotive fleet is performed by the plant's forces. This modernization plays an important role in improving the operational reliability and service life of the locomotives. On diesel locomotives alone, 125 types of modernizing operations are performed. Traction motors, in particular, undergo modernization. The pistons in D100 diesel engines are replaced by new, improved ones, and elastic gears for the traction gear box are installed, etc. More than 40 modernization operations are performed during repair of electric locomotives and about 30 when repairing electric units.

At present, modernization is being performed in two directions. The first of them is the pursuit of the goal of increasing the technical level of the hardware, the parameters and specifications of which no longer meet modern requirements as a result of protracted operation of the locomotives. The main task of the second direction is to eliminate design deficiencies from the individual assemblies and parts produced by the locomotive builders.

The conversion of many hundred VL60 electric locomotives with ignitron rectifiers to silicon rectifiers, an act which permitted conservation of

electricity during operation of the locomotive and improvement of working conditions when repairing the rectifier assemblies, can serve as an example of the first type of modernization. The total savings from this modernization was R 1.8 million annually. One may cite modernization of the carriage section of the VL8 electric locomotives, at which time additional body supports and returning devices are being installed and the spring suspension is being redone, with oscillation dampers being installed, as examples of the elimination of design shortcomings. This makes it possible to use the locomotives at speeds up to 100 km/hr.

As a result of outfitting VL19 electric locomotives with devices for current take-off from the shaft end, motor-shaft bearing wear was significantly reduced. These bearings formerly had to be replaced between planned repairs. Knurling the diesel's wheel shaft fillets for strain hardening has been introduced at plants for the repair of TEC diesel motors. This procedure has sharply curtailed crack origination in these locations. Turbo-superchargers on diesel switch engines are being replaced by turbocompressors, significantly improving the reliability of this unit in operation. The design of diesel locomotive leaf spring suspension bars has been changed, the sliding friction of adjoining parts of this assembly being replaced by rocking friction, thereby making possible a sharp reduction in bar wear. D100 diesels are being outfitted with a device permitting them to operate at idle using 5 fuel pumps, thereby providing significant fuel savings.

Much work is being done to improve the reliability of the electric traction motors for EDT-200, ED-107 and ED-107A diesel locomotives. This work includes strengthening the body insulation, replacing the rear armature packing washers, welding the terminal laminations of the armature iron, knurling the shafts and strengthening the coil leads of the primary and secondary poles. It is still early to evaluate the effectiveness of this modernization on the whole, but, based on preliminary data, the number of break-downs in modernized ED-107 and ED-107A locomotives during the guaranteed mileage period after factory overhaul has been reduced by half, and the number of times the rear packing washers have been replaced in EDT-200B and ED-107 locomotives after modernization has been reduced significantly. Thus, according to data from the locomotive depot at Sol'vychevodsk on the Northern Railroad, the number of rear packing washer failures in ED-107 electric traction motors per million kilometers of running time was as follows: 1975--2.02; 1976--0.81; 1977--0.64. The reliability of the magnetic system of these motors has also improved as a result of modernization.

Measures to further improve the service life and operational reliability of the most important locomotive and motorized car train assemblies are worked out for each 5-year plan by the Main Administration for Repair of Rolling Stock and Spare Parts Production together with the Main Administration of the Locomotive Services and the All-union Scientific Research Institute of Rail Transport (VNIIZhT). In particular, 30 research projects are being carried out in accordance with these measures during the Tenth

Five-Year Plan for diesel locomotives and diesel trains, and 66 for electric rolling stock.

Recently a complicated situation has arisen with regard to providing spare parts necessary for maintaining locomotives in running order for the railroads and repair plants. Their shortfall directly affects the reliability of the locomotive fleet, particularly diesel locomotives, and is one of the causes of difficulties in rail operations. The technical status of the locomotives and observance of planned preventive maintenance inspection and repairs at the depots and at plants depend on the repair enterprises being fully supplied with spare parts, chiefly diesel parts, in timely fashion. Moreover, the Ministries of Heavy and Transport Machine Building, the Electrical Equipment Industry and certain others do not, as a rule, provide the railroads with an adequate quantity of spare parts and locomotive equipment, particularly for diesel locomotives, on the basis of the established parts inventory. Therefore, the MPS has been forced to organize production of spare diesel locomotive parts which have not been incorporated into the current inventory at their own plants.

Presently about R 70 million worth of spare locomotive parts are being manufactured at dozens of repair plants. This production is increasing yearly. For example, during just the 4 years of the Tenth Five-Year Plan, delivery of D100 diesel cylinder liners to the railroads grew by 25 percent, piston rings by 22 percent, diesel bearing shells by 10 percent, traction gearbox gears by 90 percent and locomotive brake shoes by 16 percent. Nevertheless, the needs of the MPS repair enterprises for spare parts is not being fully satisfied. A particularly acute shortage of D100 diesel cylinder liners, pistons for these motors and piston rings is being felt. The Main Administration and the plants are taking energetical measures for the further growth of spare part production for locomotives. Casting shops are being renovated at the Dnepropetrovskiy and Poltavskiy diesel locomotive repair plants with the installation of powerful modern smelting units to increase production of liners for the working cylinders of D100 diesel engines. At the same time, work on increasing piston production is under way. Delivery of automatic lines for piston production at our plants begins in 1980, making it possible to increase their output significantly at the Lyublinskiy Casting-Machine Plant, and subsequently at certain other enterprises as well. Radical reconstruction of piston ring production has been implemented, from casting the blanks to the final finishing operations. In addition to the Orenburgskiy Diesel Locomotive Repair Plant, piston ring production has been organized at the Michurinskiy and Izyumskiy plants and the blanks for them are delivered by the Novosibirskiy Electric Locomotive Repair Plant.

New production facilities are being set up, and existing facilities at the Rostovskiy, Chelyabinskiy, Daugavpilskiy and certain other plants are being expanded to increase production of diesel and electric locomotive traction gearbox cog wheels and gears; as a result, their production will almost double in 1980 as compared with 1977. Production of locomotive

brake shoes has been supplementarily organized at the Tashkentskiy Diesel Locomotive Repair Plant, where their production will be 500,000 units in 1980 and increase to 1 million per year subsequently. Renovation of the Petukhovskiy Casting-Machine Plant, where construction of a casting shop to make locomotive brake shoes has been ordered, is under way.

It has been planned to outfit the plants with 13 automatic lines, including lines for finishing diesel pistons, piston rings, etc. in the near future in order to improve productivity and increase spare locomotive part production.

Operation of the repair plants is unthinkable without specialization. Until recently the plants were run by assigning a minimum number of locomotive series to one plant to be repaired. A specialization criterion, the type of current used, was considered first for electric locomotives, and the type of diesel engine and type of transmission (electric or hydraulic) were the criteria for diesel locomotives. Thus repair of a-c electric locomotives was concentrated at the Ulan-Udenskiy, Zaporozhskiy, Rostovskiy and, in part, at the Novosibirskiy plants. Repair of locomotives with the D50 diesel motor is performed at the Astrakhanskii and Dnepropetrovskiy plants, diesel switch engines with hydraulic transmissions and high-speed M750 and D12 diesels at the Velikolukskiy, Ivano-Frankovskiy and Saranskii plants. The Daugavpilskiy plant was specialized to repair TEZ diesels, and the Michurskiy plant for ChME diesels.

A more extensive specialization of diesel locomotive repair, one which is essentially new, has been implemented at the Dnepropetrovskiy, Poltavskiy, Izyumskiy and Smelyanskii plants. In particular, repair of traction motors and the main generators for all 4 of these plants is performed at one of them. A mutual association is presently being established among the Moscow Locomotive Repair Plant, the Yaroslavl'skiy Electric Locomotive Repair Plant and the Moscow Electrical Equipment Repair Plants on the same principles.

This method for specialization of plant production will be developed further since the number of locomotive series to be repaired significantly exceeds the number of plants at the present time. In view of the fact that each as a rule repairs several series of locomotives, it is expedient to create powerful specialized plants in the future for repair of large assemblies. A similar specialization must also be developed at existing enterprises and shops.

Broadly based cooperation of the enterprises manufacturing the most important spare parts accompanies specialization of locomotive repair work. The principle of cooperation, which was made the basis for mastering diesel locomotive and electric rolling stock repair from the very beginning, is paying for itself today; in this case, production of complex, and, most importantly, large series batches of spare parts is concentrated at individual specialized shops or sectors at a small number of plants, from where they are delivered to all of the MPS repair enterprises, plants depots, etc. For

example, the Lyublinkiy Casting-Machine Plant supplies pistons for the D100 diesel engines, the Lyublinkiy and Poltavskiy plants supply cylinder liners for the working cylinders of these same diesels, the bearing shells come from the Zaporozhskiy Equipment Plant, piston rings from the Orenburgskiy, Michurinskiy and Izyumskiy plants, electrical equipment from the Yaroslavl'skiy and Zaporozhskiy plants, traction gearbox gears and cog wheels from several plants, etc.

Given this kind of distribution of spare parts production, the most favorable conditions for using highly productive technology and special equipment, semi-automated machinery and automated lines are created. In the future, expanding the concentration of spare parts production will permit us to organize their manufacture at a higher technical level and to use fully automated systems.

As a result of specialization and cooperation in production, a majority of the plants which were converted to repair the new types of traction equipment (diesel locomotives and electric rolling stock) have exceeded their designed ratings. Output from repair of diesel locomotives increased by 32.6 percent, of electric locomotives by 18.5 percent and of electric trains by 35.2 percent during the Ninth Five-Year Plan.

Nevertheless locomotive repair needs are not being fully met. This is happening primarily because development of a factory repair base is lagging behind the increase in need, all the more so because factory repair of diesel and electric locomotives from the industrial ministries and departments have been imposed on the MPS. As a result of the disproportion which has arisen, in 1979 alone, 30 percent of the diesel and 20 percent of the electric locomotives needing major overhauls were not reconditioned. The requirements of the industrial ministries and departments for diesel locomotive repair were only 40 percent satisfied.

Much creative work in searching for supplementary production reserves, and increasing locomotive repair output and manufacture of spare parts is being done by the Main Administration for Repair and the plant collectives. Attention is being turned, first of all, to more complete utilization of existing capabilities. At many plants, the design capabilities calculated during renovation have already been significantly exceeded. In the near future, the growth of production capabilities of locomotive repair plants by an additional 8-10 percent is anticipated by increases in efficiency and intensification of production.

However, to insure that the needs for locomotive repair are fully met, the further development of a factory repair base is necessary. In particular, it is necessary to expand and renovate four diesel locomotive repair plants, two for the repair of electric locomotives and four for repair of electric trains. It is necessary to begin construction of one electric locomotive repair plant in western Siberia or northern Kazakhstan at the same time.

The Basis of Efficiency and Quality

Incorporation of a flow-line and conveyor method for repairing locomotives and their main assemblies and the creation of mechanized conveyor lines are the most important trends in accelerating the scientific and technical progress at locomotive repair plants. In this case, the flow-line-conveyor line positions are specialized to perform specific production operations, permitting mechanization of labor-intensive processes and efficient organization of manpower. Much attention is being devoted to comprehensive mechanization of repairs during the entire production cycle, beginning with cleaning and disassembly and ending with assembly and painting the locomotive.

Organization and technology are being enhanced by the efforts of the Main Administration's Planning, Design and Technology Bureau for Locomotives, the comprehensive mechanization of production processes is being developed and automated control systems and highly productive equipment are being introduced. Installation of units and parts which have been previously repaired or manufactured in specialized shops (diesel motors, electric machinery, wheels, etc.) is, as a rule, provided for in the plants' assembly shops. In this case, it is not the individual parts which arrive in the assembly shops, but units and assemblies which have been preassembled and tested. This makes it possible to reduce the duration of rolling stock repair substantially and to improve the capacity of the shops.

The experience of plants which have incorporated flow-line-conveyor methods with a forced tempo shows that because of this innovation it is possible to improve production efficiency significantly, increase production output and improve the quality. It is not coincidental that at precisely these plants the highest productive capacity output per unit of area in the basic shops and the highest labor productivity have been achieved. For example, at the Daugavpilskiy plant, diesel locomotive output per unit of area in the repair shops exceeds the average indicators for all diesel locomotive repair plants by more than 30 percent, the output of electric machinery per unit of area is 40 percent greater at the Smelyanskiy plant than at the Voronezhskiy plant, etc.

Much work is being done for mechanization and automation of the production processes for spare parts manufacture. At the Lyublinskiy Casting-Machine Plant, automatic lines have been used for machining pistons for diesel locomotive engines. Several automatic lines and hundreds of specialized machine tools are being put into operation at the plants during the Tenth Five-Year Plan. Thus at the Dnepropetrovskiy plant, a semi-automatic line is being put into production for founding and casting cylinder liners for D100 diesel engines. A method for centrifugal casting of piston ring blanks is being incorporated at the Novosibirskiy and Astrakhanskiy plants. The use of machine tools with program control is an important component of the scientific-technical

progress in the matter of repairs. This work is being carried out at the Velikolukhskiy, Ussuriyskiy, Ulan-Udenskiy and certain other plants.

The amount of rolling stock repair is constantly at the center of attention for the Main Administration and the plant personnel. This work is being done on the basis of the creative use and dissemination of the advanced experience, approved by the CPSU Central Committee, of enterprises in L'vovskaya Oblast on the development and incorporation of a comprehensive quality control system (KSUKP). The MPS plants are actively incorporating KSUKP, and the Main Administration coordinates this work and constantly controls its performance. Workers' coordinating groups, on which the organization, development and incorporation of KSUKP have been imposed, have been created at the Main Administration and at all the plants, statutes concerning these subdivisions have been confirmed and plans for their implementation have been drawn up.

In accordance with their specialization, a number of leading plants have become base enterprises for incorporation of KSUKP. At these plants, the workers' coordinating groups have been strengthened by specialists from the Planning, Design and Technology Bureau of the Main Administration. Such a collaboration of production workers and designers permits the most effective trends for practical incorporation of a comprehensive quality control system for rolling stock repair and for the manufacture of spare parts and other products to be found.

It must be noted that the development of KSUKP under the specific conditions of a transport repair facility is not a simple matter. Repair of rolling stock is, after all, the main product of the MPS plants, and all of the methodological guides from Gosstandart [State Committee for Standards of the USSR Council of Ministers] for the development and incorporation of KSUKP are only fully applicable to enterprises producing a new product. Therefore the use of these materials under our conditions is restricted and much supplementary work associated with accounting for the specific circumstances at repair enterprises is required.

The enterprise standards which were begun to be developed in 1976 are the organizational basis of KSUKP. More than 140 samples of enterprise standards of their own development and more than 300 samples from other organizations were given to the plants by the Planning, Design and Technology Bureau of the Main Administration with the aim of accelerating the work. Presently, more than 2,100 enterprise standards have been worked out and incorporated at the plants. They encompass a wide range of questions, including moral and material stimulation for improving production quality, intraplant certification of items, incoming inspection of industrial process execution, etc. Many repair enterprises have basically finished development of KSUKP. It is planned to introduce the system at all of the Main Administration's plants this year.

Developing their production capabilities, the transport industry is striving not only to increase output of scarce spare parts, but also to improve their service life. The plants of the MPS, together with workers at the VNIIZhT and the line enterprises of the railroads, are performing much work to improve the service life of vital locomotive assemblies and parts, first of all the crank and piston group of the diesel engines, traction gearbox gears and locomotive brake shoes.

Significant changes have been incorporated, for example, in the design of D100 cylinder liners. This has permitted their service life to be almost doubled, and eliminated instances of failure in these costly parts because of cracks in the area around the adapter ports. Work to further lengthen the service life of the liners is under way. A special program has been developed, in the realization of which a large group of designers, scientists and operations experts is participating. The final goal of their efforts is to achieve the stage when the liners operate from one major overhaul to another. This will not only curtail the need for liners sharply, it will also reduce the labor-intensity of diesel locomotive repair significantly in the depot.

Important work of specialists of the VNIIZhT, Lyublinksiy Casting-Machine Plant and a number of railroads on improving the design of D100 pistons has been successfully completed. The fundamentally new piston design which was created has also been adopted by the producer-plant for the new 10D100 diesel engines. Presently, the conversion of diesel engines of this type which are in operation in the 2TE10L diesel locomotives to the new pinless pistons has been completed and similar modernization of the 2D100 diesel engines in the TEZ diesel locomotive* has been started as they undergo routine major or hoisting overhauls.*

Production of piston rings from high-strength cast iron with chrome-plated working surfaces will be organized in 1980 at the Orenburgskiy plant to improve the service life of diesel engine piston rings for mainline diesel locomotives. A modern electroplating shop using automatic equipment is being created at the plant. According to available data, the service life of chrome-plated rings is twice that of rings made from gray iron, and replacement of these rings would only be required during hoisting overhauls of the diesel locomotives. Work toward using piston rings made using a power metallurgy method in D100 diesel engines is in progress. This method permits the complex technology of piston ring production to be simplified significantly.

Significant attention is being paid to the use of an elastic drive in the traction gearboxes on diesel locomotives. As is known, elastic drive increases the coupling coefficient of the locomotive, absorbs vibrations acting on the traction motors and also reduces wear of the

*Russian 'pod'emochnyy remont.'

gear teeth and cog wheels in the traction gearboxes. Operation of 2TE10V over the most arduous sectors of the Northern Railroad has shown that the elastic drive of the traction gearboxes reduced damage to the traction motors and wear of the gear teeth by a factor of 2-3. Taking this information into consideration, production of elastic gears for traction gearboxes has been organized at the Main Administration's plants, and modernization of the 2TE10L diesel locomotives has begun. Beside the design changes in the traction gearbox, tempering the gears made at the plant using high-frequency currents has been incorporated to improve their service life, and the class for the closeness at which the gear teeth are cut has been raised.

The measures which have been mentioned, together with the development of production capabilities for cutting the traction gearbox gears will permit the problem of providing parts for the rail transport repair enterprises to be solved. Simultaneously, the possibility occurs for making the existing standards for gear wear more strict, thereby significantly reducing the traction gearbox vibrations which lead to increased numbers of part failures in the traction motors and the gearboxes themselves.

Problematic Unresolved Questions

Presently the situation with spare parts production is being made more complicated by the fact that our plants are compelled to manufacture all parts for locomotives which have not been produced for 20 years and more. The railroads are even now using and repairing the VL22M, VL23 and VL8 electric locomotives and the TE1 and TE2 diesels, production of which was halted at the start of the fifties. At the same time, production of spare parts for the new locomotives being produced by the industry is organized at the MPS plants. This concerns, in particular, the VL80T and VL10 electric locomotives.

In our opinion, it would be more expedient if the locomotive producer-plants completely fulfilled the needs of the MPS repair enterprises for spare parts and assemblies for traction equipment currently being produced. When the industry converts to production of new, more highly developed locomotives, the equipment and technology designated for spare parts production for the outdated series may be transferred to the MPS plants to provide for repair of locomotives still in use. Moreover, beside the production of necessary spare parts, locomotive building plants must be obligated to perform major overhauls of certain basic assemblies and locomotive units such as the diesel units, the traction motors and main generators according to an inventory coordinated with the MPS.

Such a situation would stimulate the designers and plants in the industry to constantly improve locomotive designing and manufacturing quality. For if there is a great increase in the number of failures of any particular assembly, the producer-plant would either have to develop

capabilities for production or repair of said assembly, which would require additional capital investment, or to rework the design of the assembly radically to achieve a high level of reliability and maintainability.

It is also obvious that the creation of two parallel producers of the very same assemblies and parts for any locomotive whatsoever at both industry and MPS plants is economically inadvisable. This relates first of all to the production of basic parts and assemblies, the need for which is relatively small, being measured in units, tens and, rarely, in hundreds of parts. Here we have in mind such parts as diesel engine blocks, crankshafts, connecting rods, camshafts, reduction gear housings, casings for traction motors and main generators, carriage frames and others, the supply of which should cover the entire service life of the corresponding main units of the diesel locomotives--the diesel engine, the main generator, the traction motor and the undercarriage. Organization of single unit production of these parts at MPS plants is obviously disadvantageous and, in certain instances, generally impossible (diesel crankshafts, diesel engine blocks, etc.) because of the lack of the necessary equipment.

It is also necessary to note that the problem of increasing the production of necessary spare locomotive parts, for diesel locomotives primarily, cannot be resolved completely on the existing plant base. Calculations show that providing for the total needs of the railroads for spare locomotive parts can be achieved by building yet another plant specialized for the production of spare parts. However, construction of the plant will not come about in the near future; it is a lengthy and complex process. Therefore it is necessary for the foreseeable future to reexamine the relationship to spare parts at all of the repair plants and locomotive depots, and to organize their prudent and economical use.

There are reserves here, and not small ones. In particular, it is possible to organize the repair and reuse of the most costly and scarce parts at each plant and depot. Taking this extremely effective step must not be delayed.

Nor is it possible to reconcile oneself with the serious shortcomings in locomotive operation which frequently result in the breakdown of costly and scarce locomotive assemblies and units. At a time when a part of the locomotive fleet is significantly worn out, when new, more complex locomotives are going out onto the line, locomotives requiring the increased attention of the operations experts, when inter-repair intervals have been increased significantly, the strict observation of an established system of preventive maintenance and inspection acquires particularly great significance. As a rule, hoisting and major periodic overhauls are well organized at the depots. At the same time, however, at many depots inadequate attention is being paid to minor periodic repairs and to preventive inspections in particular. The role of these

types of technical servicing has grown significantly under modern conditions.

Violations of the number of preventive inspections and the frequency with which they were made on the Alma-Atinskaya, Tselinnaya, Bredneziatskaya, Privolzhskaya, Gor'kovskaya and certain other railroads was the cause of damage to such important diesel locomotive units and parts as the turbocompressors, traction motors, gearboxes, cylinder liners, pistons, etc. In particular, practice has shown that when the exhaust ports of working cylinder liners, the exhaust system, the labyrinth packings and the nozzle box of the turbocompressors are not cleaned on time, it results in premature wear of the rotor blades of this unit and a decrease in its rotation speed. This in turn diminishes air supply into the cylinders and causes incomplete fuel combustion, a reduction in the diesel locomotive's power and then a failure of the traction motors, pistons, cylinder liners, etc.

It has been established that on a number of railroads, cooling water for the diesel engine is not satisfactorily prepared, motor-shaft bearing loadings* are not greased and washed out on time, the condition of the traction gearboxes watched, etc. This results in a premature failure of the liner housing of the working cylinders and of the liners themselves and cooling system radiators, the premature wear of motor-shaft bearings, cogwheels and other assemblies and parts. Because of unsatisfactory maintenance of the Cardan shafts of ZTE10L diesel locomotives in operation, the front and rear gearboxes prematurely lose their ability to work properly: their cast-iron casings do not stand up to the resultant overloading.

The growth of unscheduled repairs and breakdowns on the line which result in great losses, are cause for particular alarm. In many instances, their cause is the same, minor periodic overhauls and preventive inspection not being performed up to standards. The direct loss which locomotive failures cause comes from the fact that the trains are out on the line without traction equipment. But no less harm is caused by the diversion of significant labor resources at the depots to eliminating the consequences of the breakdown. This diversion results in breakdown of the preventive maintenance and inspection system. This causes further deterioration in the mechanical condition of the locomotive fleet and new breakdowns and unscheduled repairs as a result.

There is also another side to the question. If, for example, a turbocompressor goes out on the line, they try to replace it or repair it quickly, but it is doubtful that anyone will eliminate the initial cause of the defect, cleaning the ports cylinder liners, etc. As a matter of fact, can one be expected to clean the ports when a train

*Russian 'pol'stery notorno-osovykh podshipnikov.'

which has been left at an intermediate station is awaiting this locomotive? As a result, a locomotive with the potential for another breakdown in the very near future because of the same turbocompressor is sent out onto the line.

Spare parts consumption is also directly associated with locomotive operation. In this regard, we have the remarkable experience of a number of railroads and advanced locomotive enterprises at our disposal. For example, spare parts consumption at the Poltava locomotive depot on the Southern railroad is several times less than at the depots of the Alma-Atinskaya, Tselinnaya, Sredneasiatskaya or Privolzhskaya railroads. A similar experience should receive the most widespread dissemination.

It is necessary to dwell especially on the design reliability of locomotives and their repairability. For example, it cannot be accepted as the normal state of affairs when increasing the power of a locomotive (2TE10L) by a factor of 1.5 (in comparison with the TEZ), which permitted the train weight to be increased by only 6-12 percent, with a concomitant, extremely inconsequential increase in speed on a reference grade, brought about a growth in the labor-intensity for servicing the locomotives of more than 1.5 times. At the same time, spare parts consumption for units and assemblies has increased considerably on 2TE10L diesel locomotives, particularly for units such as the turbocompressors, all types of gearboxes, and traction motors.

In striving to reduce the weight of the locomotive (which is not presently being done out of necessity since a locomotive must frequently be ballasted to provide the necessary adhesion weight), machine builders are lightening many of the basic assemblies and units, not considering while doing so that their service life should correspond to the motor capacity of the locomotive itself, i.e. 25-30 years. It is hardly expedient to manufacture these units and their parts from light-weight materials in all instances. For example, the set service life for an M750 diesel engine block manufactured from aluminum alloys is only 3 years. Turbocompressor and 11 degree supercharger housings for the 2TE10L locomotives which have been made from aluminum alloys are unrepairable for practical purposes, and most frequently they must be replaced by another unit, even though damage is slight.

When there is mechanical damage to any part of a diesel locomotive's traction motor armature (shaft, packing washers, etc.) due to design shortcomings, it is also necessary to replace the copper winding. Such defects constitute 65 percent of all damage to traction motor armatures, and this means that tens of hundreds of tons of expensive winding wire are uselessly lost. At the same time, the electric locomotive traction motors do not have this serious design shortcoming. The armature iron in them is not pressed onto the shaft, as in the diesel locomotive motors, but onto a special bushing. This permits a number of armature

parts to be changed without damage to or replacement of the armature coils.

Designers at the Khar'kov "Elektrotyazhmash" plant, making some kind of design changes in diesel locomotive traction motors or designing a new traction motor, frequently forget that this unit will undergo major overhauls and intermediate overhauls several times at plants and depots during the course of its service life. For example, "Monolit" insulation is used on the pole coils of ED118 traction motors, but the designers did not think how these coils are to be repaired. As a result, the coils are being replaced by the thousands at the Smelyanskiy plant, responsible for reconditioning the ED118, because of the defects arising in them. The new coils which are required are being supplied to the railroad workers by "elektrotyazhmash" producer-plant, unproductively expending their work force and costly rolled copper to manufacture them. And the old coil design worked for practically the entire service life of the traction motor. The question comes up: why was this "improvement" which was not tested in operation ever introduced? The same plant changed the way the motor-axle bearing journal box is mounted on the traction motor housing, and a problem of repairing the cut which is being worn into the housings has arisen. This problem has not, as yet, been solved by anyone.

It is entirely incomprehensible what influenced diesel engine builders, providing for the occasional replacement of the working cylinder liner of type D100 diesel engines which have failed (or been damaged) between major types of overhauls (with disassembly). The actual service life of these parts is such that it is not expedient to replace them during the first hoisting repairs at the depot, whereas they do not last until the intermediate overhaul. In fact, the working capacity of operating cylinder liners on diesel locomotives is adequate for 550,000 kilometers on the average. Hoisting repairs, in which the diesel motor is dismantled, are made every 240,000 kilometers, whereas intermediate overhauls are performed at plants every 720,000 kilometers. Thus, if the liners are completely replaced during the second hoisting repair at the depot, they will deplete only half of their capabilities before the intermediate overhaul, and complete replacement of the liners is required by regulations during factory overhauls of the diesel locomotive. As a result, liners with significant mileage left on them before the actual motor potential is realized are removed from the locomotives, causing excessive consumption of these costly parts. The same picture is observed with the pistons for these diesel engines as well. It is apparent that it is necessary to increase the motor capacity of operating cylinder liners and pistons of D100 diesel engines so that they last at least until factory overhaul. This will permit us to reduce the demand for these extremely scarce spare parts, the production of which requires significant labor, material and monetary expenses.

The situation with many other spare parts, units and assemblies for locomotives, the reconditioning or remanufacture of which requires the immense efforts of thousands of people at many repair plants and locomotive depots is analogous.

The low quality of planning and manufacturing such costly equipment as traction motors causes a sharp growth in demand for their major overhaul significantly earlier than the established service times. Here the industry should supply PETVSD wire with enameled, mica-like glass insulation*, which is moisture-proof, to eliminate defects associated with electrical damage to diesel locomotive engines. However, we receive winding wire with asbestos insulation which absorbs moisture. It is not surprising that after this kind of repair, the traction motors do not regain the specified motor capacity.

Dozens of diesel locomotives have been retired from operation at locomotive depots because of failures in the TKZ4 turbocompressors and 11 degree superchargers. And the cause of all of this is the impossibility for cleaning the dirty labyrinths without removing the turbo-compressor from the locomotive, plus the inadequate strength of this unit's housing. Our plants, which are repairing the TEP60 diesel locomotives, which are not bad on the whole, today are experiencing great difficulties in association with the appearance of cracks in the blocks of 11D45 diesel engines. The blocks cannot be repaired, and the Kolomenskiy Diesel Locomotive-Building Plant is supplying only 30 percent of the required number of new blocks. The cylinder bottoms, which should serve for the entire service life of the engine, must be replaced on these engines during each intermediate or major overhaul because of cracking.

All of these, as well as many similar examples indicate serious shortcomings in the design and manufacture of new locomotives. Noncompliance with the requirements of state standards and putting crude, unfinished designs into production are costly. It is enough to say that presently the MPS repair plants are compelled to carry out an immense volume of locomotive modernizations during intermediate and major overhauls, the cost of which is tens of millions of rubles annually.

The complex, but extremely important problem of creating reliable, durable and economical traction equipment requires profoundly thought-out, technologically and economically well-based, comprehensive decisions which take into consideration the urgent needs of transport from all sides, from national economic positions, is one of the most important elements in our economic system. In our opinion, Gosplan USSR and the USSR State Committee for Science and Technology should be in charge of this State operation, attracting all interested ministries and departments.

*Russian 'emalestekloslyudyanyitovaya izolyatsiya.'

It is only possible to insure reliable, highly productive and efficient operation of the locomotive fleet by using the joint efforts of industry and the railroad workers, science and practice, scientists, designers, repair workers and operations specialists.

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Industrial Approach

Moscow GUDOK in Russian 6 Jun 80 p 2

[Articles by V. Smakhtin, Head of the Depot's Technical Department, N. Gvozdetakiy, Chief Technologist of the Depot and Professor V. Chetvergova, Pro-rector for Science, OmlIT (Omsk Institute of Rail Transport Engineers), doctor of technical sciences: "Repair--The Industrial Approach"]

[Text] Moskovka is the youngest locomotive depot on the Western Siberian railroad and one of the largest in the network. This enterprise rapidly converted to the industrial method for reconditioning electric locomotives, having outfitted their shops with flow-lines and mechanized positions. The experience of the electric locomotive workers of Moskovka has been studied more than once during studies at the network schools, and we have been told about it at the USSR VDNKh [Exhibition of USSR National Economic Achievements]. Even now this depot is an exemplary enterprise, an example of the organization of repair work and improved locomotive reliability. Its personnel work in close collaboration with men of science.

The Main Task (V. Smakhtin)

From the time when locomotive servicing was converted to a shift system, repair workers became masters of the machines. It is they in particular on whom the operational reliability of a locomotive depends. Therefore when the fleet was being replaced by more powerful VL10 electric locomotives, we carried out a radical reconstruction of the repair operations within the complex. Builders erected the new TR-2 [Minor repair and maintenance-2] wing for six bays with a full complement of the necessary equipment. We rebuilt all of the remaining shops ourselves, the question being posed thus: How can we do everything in the shortest time period without reducing the repair program? An initiative group which included engineers and workers from practically all sectors was created under the management of the Depot's Chief Engineer F. Kostyuk.

Much has been done during the past 3 years. The builders turned over the TR-2 shop, and it is operating at full capacity. Drying of the electric locomotive traction engine has been newly organized: a combined

method of drying using both a heating element and current. And whereas this operation required up to 6-7 hours previously, now it takes no more than 3. Moreover, the the wintertime, a 2-3 hour pre-drying of the motors is done at the start of repair work. This step greatly accelerates their reconditioning process and improved the quality.

The manufacture and incorporation of mechanizing equipment permitted us to increase the program of repairs without increasing the production areas of the staff of mechanics for practical purposes. Organization of a flow-line in the electric machine shop made it possible to almost double output of engines from repair.

The dispatching service is operating precisely. It keeps track of the mileage on the equipment and sees that the electric locomotives are sent in on time for the various types of planned repair, it insures that work sites have spare parts and materials and sees to it that the network traffic schedule is observed. The depot dispatcher is the director of repair operations, and quality depends on the rhythm and perfection of the depot's organization.

The shop's equipment permits us to insure a high guarantee of machinery operating reliability on the line. The idle time for electric locomotives in minor repair and maintenance TR-2 has been reduced by 25 percent, and in TR-1 by 11 percent. During the most comprehensive major overhaul TR-3, idle time for the equipment has been reduced by 14 hours, and is now 3.4 days.

Refinement of the repair process is continuing. Just last year, the depot's efficiency experts incorporated 400 improvements. The initiative group is also continuing its work. It is developing a prospective plan for development of the depot during the Eleventh Five-Year Plan. In many regards, the details of this plan have already been determined. The main task is to provide the Trans-Siberian Railroad line with reliable locomotives.

The Struggle for Reliability (N. Gvozdetkiy)

It was as if the dense network lines on the dispatcher's traffic schedule parted: a step appeared, indicating that a train had stopped out on the line. And when the cause of the stop was clarified, the dispatcher here wrote down "Breakdown of VL10 electric locomotive No 1408." Its engineer, Com Novozheyev, had turned the heavy train into the station and stopped with difficulty. During his examination of the locomotive, he detected the fused contacts of the fast-response circuit breaker to the auxilliary motors. The delay in train movement was 32 minutes.

Electric locomotive breakdowns on the line are an emergency. In order to reduce them to a minimum, we analyzed the causes, doing so when the "small" motors (the VL23) were in operation. Then we shifted our

studies to the VL10 as they appeared at the depot. In 1977 the fleet replacement was finished and we had accumulated many unresolved questions by that time, such as how to avert equipment breakdowns on the line. Having made an analysis of the breakdowns, we attempted to trace their nature and to predict their reliability in certain instances. In the first year the VL10's were in operation, the 41-2 contacts began to fail. We started to analyze why. It turned out that there was inadequate spark quenching. The contacts could not hold up, and they burned out. Having established the cause, we found a way out of the situation, and the next year there were only half as many breakdowns.

During the 3 years the new motors have been in operation, we have accumulated statistical material which requires processing, interpretation and a search for ways of improving reliability. We have strengthened the reliability group with a supplementary contingent of engineers. Scientists from the Omsk Institute of Rail Transport Engineers and specialists in the line's locomotive facilities service are constantly assisting us greatly.

We greet all who come to our depot to perform their various experiments. Thus last winter new brushes for the EG-75 traction motors developed by the VNIIEI [expansion unknown] underwent operational testing here. Of course, we would like for the new product to be registered at the plant more rapidly. Along with other measures, the use of the new brushes permitted us to reduce traction motor breakdowns because of the coupling-hysteresis effect of the commutator strips.

We inform the railroad locomotive facilities service and the Main Administration of the MPS of each of our innovations, anticipating that an effective way to improve reliability will quickly find its way to us. But the reaction among specialists is delayed. And a long time passes from the time an experiment is initiated until its mass implementation.

A Concrete Affair of Science (V. Chetvergov)

The collaboration of science and its practical implementation is always concrete. The benefits are reciprocal. The depot's personnel are successfully solving large-scale scientific and technical problems with our assistance. And we, having the same base as the depot, can solve these problems on a network-wide scale. All else aside, 46 of the depot's 52 engineers are our alumni. This is by no means the last circumstance for organizing business contacts between an enterprise and the institute.

Recently we have been solving problems directed toward improving the reliability of traction motors. At the OmlIT, Prof M. Karasev is in charge of all of the developments on commutator reliability for these units. These critical motors are tested and adjusted under load on special test stands at the Moskovka depot using instruments and methods developed by the group which he heads. A group of workers from the

institute, engineers from the depot and students working toward degrees, headed by docents R. Medlin and V. Galkin, performed experiments aimed at improving the reliability of the VL10 electric locomotive's electrical equipment.

Several years ago it was generally acknowledged that it was inadvisable and uneconomical to use regeneration as the train passed over flat land. On the recommendation of our scientific associates, the Moskovka depot's engineers started to turn on the regeneration circuit, and, 4 years later, when regeneration is used on a mass scale, the return of electric energy into the contact network is approaching 30 million kilowatt-hours.

It would seem, "What do you need science for here?" An electric locomotive is equipped with regenerative braking. Teach the engineers how to use it and the matter is done. But it is not entirely this way. In the first place, it was necessary to overcome the prevailing point of view that it was ineffective to regenerate on the flat. This type of research was performed by associates at the institute, docents R. Medlin and V. Galkin, and the deputy chief of the railroad's locomotive service S. Rozhdestvenskiy. In the second place, the use of regeneration on these sectors has its own peculiarity. That means that it is necessary to recommend to the engineers how to employ these features. Research, analysis and supplementary work to strengthen the reliability of the individual units of the electric locomotive were also required. This is the sum total--up to 40 million kilowatt-hours of electricity are being returned to the contact network by the engineers while running on the straightaway.

On many questions, we work in close contact with Moskovka Depot personnel. Not only technical questions. Among them are preparation of cadres, lessons in communist labor schools, helping efficiency experts and in the development of plans for social development.

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RAILROAD

TRANSPORT CONSTRUCTION MINISTER CITES ACHIEVEMENTS, GOALS

Moscow GUDOK in Russian 10 Aug 80 pp 1, 2

[Article by USSR Minister of Transport Construction I. D. Sosnov: "On Time and With High Quality"]

[Text] In our country much attention is being devoted to capital construction. Considerable capital and material and technical resources are being allocated for these purposes. And it is extremely important for the outlays to be recovered more rapidly and for the capacities to be put into operation and assimilated on time.

The June (1980) CPSU Central Committee Plenum was a major event in our life. The report of General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet Comrade L. I. Brezhnev and the plenum decisions evoked a new surge of labor and political activity. The transport construction workers took as a guide to action the instructions of Comrade L. I. Brezhnev on the need to exert the utmost energy in order to successfully fulfill and exceed the plan of the final year of the 10th Five-Year Plan, to put into operation and assimilate on time the production capacities of start-up projects, to reduce the amount of unfinished construction and uninstalled equipment and to ensure the stable functioning of the national economy in 1981.

The transport construction workers have gained considerable experience in organizing the work at start-up projects. The responsibility of the operators has also increased. Competition according to the principle "The Workers' Relay Race" is becoming widespread. Thus, the collectives of Kazakhtransstroy, the designers of Almaatagiprotrans and the railroad workers, having concluded an agreement on labor cooperation, are bringing a year closer the date of the renovation of the Mointy-Chu-Arya' section. Owing to cooperation the operators and construction workers on the Moscow and October Railroads have achieved significant labor gains. The staffs of construction projects, which are being set up at a number of facilities, have given an excellent account of themselves. Equipment is being used efficiently on a multishift schedule in the columns of the Uralstroyemkhanizatsiya Trust, which are engaged in the construction of railroads in Western Siberia.

And yet the advanced know-how has still not become accessible to many subdivisions of the ministry.

With what indicators have the transport construction workers arrived at their occupational holiday? The amount of construction and installation work on the general contract and on their own, which was performed in the first half of the year, exceeded the level of the corresponding period of 1979 by 3.1 percent. But the assignment on the total amount of contract operations was not fulfilled. And at the projects of the Ministry of Railways the lag was 3.9 percent. It is a matter of honor of the transport construction workers to make up this debt in the near future.

The subway workers have done some good work. They put into operation ahead of time, by the Day of the Construction Worker, the second segment of the first section of the Tashkent subway: the four difficult kilometers of the Oktyabr'skaya - Stantsiya imeni Maksim Gor'kiy section. The mentioned collective of Kazakhtransstroy, which achieved good results in the renovation of the Mointy-Chu route, has already brought pleasure. At the same time the subdivisions of the Main Administration for Railroad Construction of the Urals and Siberia fulfilled only 94.1 percent of the six-month assignment.

Now our efforts should be focused on solving the main task--the fulfillment of the amounts of contract work, which were set for the year, and the main assignments on placing start-up projects into operation. For the Ministry of Railways 654 km of new rail lines must be put into continuous operation.

These lines are of great importance for improving transportation connections and ensuring the stable functioning of the national economy during the first year of the 11th Five-Year Plan.

Thus, the Berezovka (Duki) - Komsomol'sk-na-Amure line will provide a direct link with the regions of the Far East over a shorter route. The Malinovoje Ozero - Lokot' line will make it possible to shorten by more than 500 km the run of freight from Eastern Kazakhstan and the southern part of Altayskiy Kray to the Urals and the European part of the country. The Synya - Usinsk line is the route to the center of the oil-bearing region of the Komi ASSR. Such roads as the Agryz - Mendeleyevo, Muraptalovo - Orenburg, Masis - Nurnus are no less important.

On the sections of renovation 918 km of second tracks must be built and put into continuous operation. This will make it possible to increase the capacities of congested routes. It is necessary to convert 1,275 km to electric traction and to equip 2,653 km of roads with systems of automatic blocking and centralized traffic control.

Much has to be done to strengthen the repair base of rail transport. This means putting into operation capacities at plants for the repair of 3,560 cars, 220 diesel engines, 15 engine car sections, 12 refrigerator trains, 2,000 electric machines, 2,000 traction motors, as well as shops for the

production of cast steel, metal containers. And finally, to ensure the turning over of schools, vocational and technical schools, children's pre-school institutions, hospitals, polyclinics, more than 1.37 million m² of housing, of which a large portion is for railroad workers.

In order to lay the foundation of successful work starting with the first days of the next five-year plan, along with the fulfillment this year of the plans of contract operations, it is necessary to fulfill the assignments on increasing the technical level of construction.

The work being performed in the ministry on implementing the decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality" will promote the solution of these problems. Basic measures, which have been reviewed and approved by the collegium of the ministry, have been elaborated in conformity with the decree. It is envisaged to expedite the placement of production capacities and facilities into operation, to increase the technical level and quality of transport construction, to improve material and technical supply and the provision of complete units, to improve planning and to achieve the further development of cost accounting.

In all 229 newly begun construction projects have been eliminated from the plan of contract operations of the Ministry of Transport Construction for 1980. The concentration of forces and capital at the carryover projects of rail transport has been increased by means of this.

Jointly with the Ministry of Railways we have elaborated and approved measures on the assurance of the fulfillment of the plan of operations at the most important construction projects, have brought closer the date of the placement in operation for the second and third quarters of 300 km of second tracks, 344 km of automatic blocking and centralized traffic control, mineral fertilizer warehouses for 100,000 tons and 260,000 m² of living space.

At the same time the number of projects under construction of our own production base has been decreased, while the plan assignment on construction and installation work has been increased by 9 million rubles.

During the first days of this year 11 construction and installation trusts of the ministry were converted to the conditions of planning and the evaluation of operational activity according to the commodity construction production. Another 33 trusts are being converted starting in the second half of the year. The remaining subdivisions of the ministry will convert to the new conditions of planning and the evaluation of their activity according to the commodity construction production during the first year of the 11th Five-Year Plan.

Much work is being done on the further improvement of the supply system and the structure of the management of transport construction in order to

balance the plan assignments with the material and technical resources. Economic services are being strengthened in the main link--the construction and installation trusts and the administrations of construction projects, other problems are being solved.

The collectives of transport construction workers responded with zeal to the party appeal to greet the 26th CPSU Congress with shock labor and to launch socialist competition in honor of the congress. Many subdivisions have revised the previously assumed obligations and assumed new, more strenuous ones. They are aimed at the early fulfillment and overfulfillment of the plans set for 1980 and the further increase of production efficiency and work quality. The collectives of the Kuzbasstransstroy, Dneprotransstroy, Kazakhstransstroy, Sevzaptransstroy, Tyndatransstroy, Transenergomontazh, Beldorstroy, Sverdlovskdorstroy, Chernomorgidrostroy, Transgidromekhanizatsiya trusts, Mostostroy Trust No 5, the Moscow Subway Construction Administration and the Leningrad Subway Construction Administration came out as the initiators of the counterplans. We are fully confident that their initiative will be followed up at all transportation projects.

In order to increase the effectiveness of socialist competition and to achieve great results, we need to step up the organizing work, cultivate in each person a sense of responsibility for the fulfillment of the assumed obligations. It is necessary to see to it that the know-how of production leaders becomes accessible to all collectives.

The ministry attaches great importance to valuable initiatives. Let us take, for example, the brigade contract method. The extent of the introduction of the new form of cost accounting in the organizations of the Ministry of Transport Construction is steadily increasing. Last year 40 percent of the total amount of construction and installation work was performed by the contract method. This is 3.9 percent more than in 1978.

An important step forward has been made by the Mostostroy Trust No 5. It resolved to perform the entire amount of construction and installation work by the brigade contract method. And its subdivisions are successfully fulfilling the assignments according to all the technical and economic indicators. This collective has again won the Challenge Red Banner.

In our country good work experience of completely mechanized brigades according to this method has been gained in the Uralstroymekhanizatsiya Trust and the mechanization trusts of the Main Administration for Construction of the Baykal-Amur Railway Line. At present more than 350 brigades are working in this way.

We attach great importance to the use of the contract as a whole in the sections of foremen and construction superintendents. Some 250 sections are already working in this way. But we still have many difficulties in the way of the development and extensive introduction of the brigade contract. We should overcome them by devoting more attention to this important section of our work.

Great and responsible tasks face transport construction workers during the first year of the 11th Five-Year Plan. The amounts of work on the Baykal-Amur Railway Line are increasing considerably. Here, in addition to putting the Ust'-Kut - Kumerma section (261 km) into continuous operation, it is planned to begin temporary operation on the Tynda - Ust'-Nyukzha, Etterken-Iaikan and Tataul-Mul'muchakam sections with a total length of more than 500 km. The rate of construction of the Baykal'sk, Severomuryskiy and the cape tunnels has to be stepped up, the work on the Kadarskiy tunnel has to begin.

In 1981 it is planned to place the Surgut-Urengoy Railroad into temporary operation. It is proposed to put 768 km of second tracks and 960 km of electrified rail lines into operation. The electrification of the Druzhinino-Yanaul, Orsha-Baranovichi and other rail lines will be continued, and the electrification of the Arkhara-Shimanovskaya and the Krivoy Rog-Dolinskaya lines will also be started. Some 2,470 km will be equipped with automatic blocking and centralized traffic control.

It is planned to increase the amounts of construction and installation work, which is aimed at the development and renovation of the plants of the Ministry of Railways for the repair of rolling stock and the production of spare parts. The expansion and renovation of 54 plants, including the Dnepropetrovsk, Novosibirsk and Murom switch plants, the Plant imeni Voytovich, the Lyublinskiy, Popsanyanskiy, Konotop, Ussuriysk, Nizhneudinsk, Chita, Alma-Ata and other plants, will be continued. At these enterprises it is envisaged to put into operation production capacities for the repair of 4,045 freight cars, 200 electric locomotives, 2,200 sets of switch throwers, 6,500 5-ton containers.

The draft of the plan for 1981 outlines the fulfillment of contract operations on the further development of railroad junctions and stations, the construction of facilities of the engine, car, freight, passenger and other services. It is planned to increase the amount of subway construction in Moscow, Minsk, Gor'kiy, Novosibirsk, Kuybyshev and Sverdlovsk. The construction of the subways in Leningrad, Kiev, Khar'kov, Baku, Tbilisi, Yerevan and Tashkent will be continued.

It is envisaged to put into operation 106 km of state roads and 665 km (as against 415 km in 1980) of hard-surface field and interfield roads in the regions of the petroleum and gas deposits of Western Siberia.

The construction of mechanized piers at the river ports of Nadym, Urengoy, Sergino, Nizhnevartovsk and Labytnangi, of runways at the Povkhovskiy and Severo-Var'yeganskiy petroleum deposits, as well as several other projects is continuing.

Such are our tasks for 1980 and 1981. The transport construction workers in business cooperation with the railroad workers, having launched socialist competition extensively for a worthy greeting of the 26th CPSU Congress, will exert all efforts and energy for the fulfillment of the plans and goal targets of the final year and the 10th Five-Year Plan as a whole. They will ensure the timely and high quality preparation for the accomplishment of the great tasks facing them in 1981--the first year of the 11th Five-Year Plan.

OCEAN AND RIVER

INCREASING THE LEVEL OF OPERATIONAL WORK

Moscow MORSKOY FLOT in Russian No 6, June 80 pp 1-5

[Article by A. Goldobenko, Deputy Minister of the Maritime Fleet]

[Text] The rapid development of our national economy and growth of Soviet foreign trade require improved operation throughout the transportation system. Transport operations affect the indexes of socialized production effectiveness since transport costs are a significant part of the overall cost of production.

The approaches to development of the entire national transportation system were clearly defined in the "Basic Directions for Development of the National Economy of the USSR in the 1976-1980 Period," adopted by the 25th CPSU Congress. Today we can summarize some results of maritime transport activity during the first 4 years of the 10th Five-Year Plan.

From 1976 to 1979 the basic funds of the primary (operational) activity of the Ministry of the Maritime Fleet (MMF) increased by 35.7%, the transport fleet deadweight increased by 2.9 million tons, and 27 trans-shipping complexes entered operation for the trans-shipment of general-purpose, bulk, and tanker cargos with overall dock length 5.7 km and annual handling capacity 4.5 million tons.

In 1980, the last year of the five-year plan, vessels totalling 600,000 deadweight tons will enter operation. These are basically roll-on/roll-off carriers, container ships and bulk carriers. Thirteen more trans-shipping complexes with annual capacity of 4.5 million tons will enter operation at the ports.

Among the largest five-year-plan projects are the Il'ichevsk-Varna ferry route, designed for 4 million tons annual cargo traffic, the coal and ore trans-shipping complexes at the Vostochniy and Nikolaev ports, the oil handling pier at Cheskharis for receiving 250,000-ton capacity cargo tankers with handling capacity 20,000 tons per hour, and the container terminal at Il'ichevsk.

The ports were equipped with considerable additional trans-shipping equipment, equipment for mechanizing manual operations, packeting and containerization, which in the final analysis made it possible to raise the level of integrated mechanization for the NGRF ports on the whole to 93.7 percent.

During these years much has been done to improve the management and organization of operations, both in the fleet and in the ports.

The first phase of an ASU (Automated Control System) has entered operation in all the shipping organizations (except the Central Asiatic Organization) and in 11 ports. The second ASU phase has entered operation in several of the shipping organizations and ports. At present, many problems of day-to-day and statistical accounting and operational activity analysis are resolved in the shipping organizations and ports with the use of computers. Serious steps have been made in solving with the aid of computers one of the basic problems of improving the efficiency of the operational process--preparation of continuous shipping fleet operation schedule-graphs (NGRF) continuous port operation schedule-graphs (NPGRP), and continuous transport centers operation schedule-graphs (NPGRTU).

The introduction of progressive collective forms of port labor organization and payment is having a positive effect in optimizing performance of the loading and unloading process and in improving labor productivity. At present, 93.1 percent of the port workers occupied in loading and unloading are working in complex brigades. Some 79.2 percent are working in consolidated complex brigades (UKB), which were created on the basis of an initiative (approved by the CPSU Central Committee) of the Il'ichevsk port worker brigade led by A. Baranovskii.

Seventy-seven brigades with 3800 members are working on the basis of profit-and-loss accounting.

Transition to the new system of ship handling organization in the optimal regime on the basis of continuous schedule-graphs of port operation has been completed. Systems have been developed on this basis for coordinated operation of the transport center enterprises, using the experience of the Leningrad transport center teams (approved by the CPSU Central Committee).

The normative basis required for effective transport center functioning has been developed with the introduction of these documents.

At present, 16 transport centers are using continuous schedule-graphs, which has made it possible to reduce ship handling time by 5-6 percent, rail car handling time by 7-12 percent, and truck handling time by 15-20 percent.

Cargo shipment in containers has increased by a factor of 1.5 and cargo shipment in packets has increased by a factor of 1.7; many new cargo handling technological schemes have been introduced.

Speaking of outstanding performance, we should mention those individuals whose selfless and creative efforts have made a significant contribution in improving fleet and port operations. These include I. Romanov, Leningrad Port UKB team leader; V. Zimoglyad, Odessa Port UKB team leader; A. Rotor, Il'ichevsk Port UKB team leader; G. Balyuna, Korsakovskii Port UKB team leader; A. Ambrosov, Magadan Port UKB team leader; S. Gostishchev, Vladivostok Port UKB team leader; V. Rostovtsev, Chief Engineer of the Vaninsk Port; N. Kozonyuk, group engineer dispatcher of the shipping and traffic fleet service of the Novorossiisk Port; the crews of the following ships: "Vladimir Il'ich" (Captain G. Mitelev), "Epifan Kovtyukh" (Captain N. Lavrent'ev), "Ivan Franko" (Captain Yu. Orlov), and many others.

The all-out, inspired efforts of the ship crews and shore personnel together with the new economic management modes and methods, as well as modern technology and advanced experience have made it possible for the ministry as a whole to fulfill the plan for the first 4 years of the five-year plan with respect to coastal cargo shipping by 104.1 percent, foreign cargo shipping by 100.8 percent, and cargo handling operations in the ports by 103.4 percent.

We have entered the final year of the five-year plan, concerning which L. I. Brezhnev, general secretary of the CPSU Central Committee and president of the Presidium of the USSR Supreme Soviet said at the November 1979 plenary session of the CPSU Central Committee: "The coming year is not only the final year of the present five-year plan but also the base on which the next five-year plan will be built. This is the year of active preparation for the 26th CPSU Congress. It is from these positions that we must evaluate the work which has been accomplished and the goals for 1980."

Following these suggestions, we need to examine our operational deficiencies, define the reserves, and note and carry out in each collective organization--on each vessel, in each port, shipping enterprise, KhES, GKHO [expansion unknown] and ministry--specific measures applicable to the local conditions for more complete and timely satisfaction of the requirements of the national economy and the population for shipping, accomplished with minimal transport costs. What are these basic approaches? First of all, radical improvement of annual, quarterly and monthly planning of fleet and port operation. It should now be clear to everyone that the operation of each enterprise, production volume and product quality, smoothness of production, and many other factors depend in large measure on the depth and completeness of planning. In transportation, not only the volume of traffic handled but also traffic operational quality--effective, speed and damage-free cargo delivery--depend on the realism of the plan. Plan fulfillment proceeds more precisely and smoothly when annual and quarterly plans are realistic.

Consider, for example, shipments to the Far North and Arctic regions. Most of these shipments are planned by USSR Gosnab [State Committee for Material and Technical Supply], which as a result of extensive and detailed coordination with the cargo shippers approves each year realistic cargo delivery volumes, routes, and times. Subsequently the Gosnab subdivisions

organize systematic monitoring of arrival of the cargoes and their shipment by rail and sea transport. We see the same pattern in the planning of GKEB cargo [State Committee on Foreign Economic Relations] and export lumber cargo shipments from the port of Igarka. GKEB and the shipping organizations are firmly convinced of the realism of these plans; they know that the cargoes will arrive and that they must be shipped. To this end they ensure timely preparation of the ports and vessels, arrange with the railroad personnel for shipment to the ports on schedule, work out together with GKEB, the Ministry of the Forestry Industry of the USSR, and V/O Eksportles/Lumber Export/, and several other Ministries and departments specific coordinated measures which in the final analysis make it possible to fulfill these plans year after year, and generally in accord with the established schedules. But this is only a small part of our efforts.

With regard to most aspects of foreign trade cargo shipments such precise and responsible planning still does not exist, which reflects seriously not only on functioning of the transportation system but also on the quality and timeliness of foreign trade agreement performance.

At the present time, when over 90% of the maritime fleet cargo traffic is associated with shipments to foreign destinations, it is particularly important to improve the quality of planning and organization and increase export and import cargo tonnage. Foreign trade geography has broadened, the maritime routes have become longer--vessel trip time has reached four to five months--and it is quite obvious that under these conditions realistic planning for future shipments is necessary for effective organization of fleet functioning. This goal can be achieved if we have realistic annual and quarterly shipping plans, confirmed with respect to individual cargoes by direct economic agreements between the Ministry of Foreign Trade and Ministry of the Maritime Fleet organizations.

MMF has taken such a step, approving in 1974 the introduction in the Black Sea shipping organization of continuous three-month fleet operation scheduling. Today continuous scheduling is being introduced in all the shipping enterprises. In the next year or two such scheduling will be carried out with the aid of computers, but a realistic cargo base is necessary in order for this most progressive form of fleet operation planning to yield the maximal effect.

V. B. Gushenko, Minister of the Maritime Fleet, wrote in the magazine *Kommunist* (No 17, 1978): "It seems to us that the principle of continuous planning and control, reflecting the objective continuity of the transportation process, should form the basis for the solution of all questions of maritime transport management." Experience has shown that the basic direction taken in the design of the "shipping-port" automated control system--the development and introduction of continuous fleet and port operational schedules for the long-term future--is correct.

Introducing continuous scheduling of fleet operations, MMF had in mind solution of the primary problem--constantly, at any period of time, visualize

the operation of each vessel and the entire shipping fleet for a three-month future period in order to have the minimal time required for making decisions concerning where and for what cargoes to direct each vessel in its next trip for most complete satisfaction of our foreign trade needs.

Introduction of the NGRF broadened considerably the following capabilities: for improving the organization of monitoring of the fulfillment of the quarterly shipping plans and for taking timely measures for satisfaction of these schedules; for early examination of the situation in the ports to which the vessel is to be (but has not yet been) directed, since only in this case is it possible to make the proper decision on how to avoid or minimize vessel layover time; for improvement of the quality of chartering of foreign tonnage or hiring out Soviet tonnage; for seeking optimal solutions of the questions of outfitting, fueling, repairing, crewing, and other questions associated with the operation of each specific vessel or group of vessels.

Time has confirmed the validity of the approach adopted and in those shipping organizations where NGRF is given adequate attention the style, forms, and methods of operation have changed significantly for the better. Typical signs of this are the precise fulfillment of the pledges made and the stable (on the NGRF time scale) operation of each vessel.

I would like to cite the operating personnel of the Baltic shipping organization. I believe that adoption of the new methods of operation is one of the primary factors in the successes of the Baltic shippers in the one-on-one competition between the teams of the Baltic and Black Sea shipping organizations.

Confirmation of this conclusion is the fact that at the end of last year the Board of Directors of the Ministry discovered serious deficiencies in the organization of fleet operations in the Far East shipping organization. Many of these deficiencies are a consequence of unsatisfactory introduction of continuous scheduling of fleet operation. The managers of the shipping organizations and GKbO must examine in detail the situation relating to utilization of NGRF, generalize the accumulate experience, and point out specific ways to utilize all those advantages which continuous graphic scheduling provides.

Continuous scheduling of fleet operations will also play an important role in improving trip planning and ship economic management. The KhEGS personnel and detail in greater degree the characteristics of the coming trips, determine in advance cargo readiness, nature of the cargoes, the situation in the ports, the cost of stevedoring, vessel handling, and other operations, the cost of fueling, and so on, and can provide the captain with "fresh" recommendations regarding future trips. In this case the "realism" of the trip plans will improve markedly, and hence quite different possibilities will open up in mobilizing the crew for realization of these plans.

At the present time economic planning in the transport fleet is accomplished in accordance with the "Provisional Standard Instruction on Economic Planning for Maritime Transport Vessels" and the "Standard Instruction on Maritime Vessel Operational Trip Planning."

Both of these documents are in need of revision. Several of the indexes used to define vessel operational effectiveness also require re-examination. Specifically, it is evident that the crew should be held responsible only for those trip performance characteristics which depend directly on the crew actions, or for fulfillment of the consolidated standards approved by the shipping organization for the fleet routes for the conduct of NCHP. In the latter case the role and importance of continuous scheduling increase still more. It is necessary that Soyuzmorniproekt /State Planning, Design, and Scientific Research Institute of Marine Transportation of MOP/ together with the operating personnel of the central organization of the Ministry, GKhO, and the shipping companies analyze in detail before the end of the current year the pluses and minuses of the existing directives and prepare a new document corresponding to the interests of both the crews and the shipping companies, and in this way obtain maximal effectiveness in fleet utilization.

A few words concerning the shift-day schedule of the port. At the present time this schedule is prepared on the basis of the continuous graphic schedule of port operation and the equipment and manpower resources of the port as of each day. In most ports fulfillment of the shift-day schedule varies in the 70-80% range. Is this good or bad?

The shift-day schedule should be based on the actual number of cargo handling lines with account for their productivity, the ship arrival schedule for the plan days, the previously coordinated number of railroad cars and trucks which will be available, and the support operation standards. The largest amount of reliable information is available for preparation of the daily schedule, and this information can and should be realistic. Only in this case will the shift-day schedule play the role of an organizing document, for nonfulfillment of the directives of which those performing the work can be held fully responsible. By raising the scheduling discipline to this advanced level we create the conditions for improving the activity of the entire maritime transport industry.

In recent years the shipping companies and GKhO together with Soyuzmorniproekt, TsNIIMF /Central Scientific Research Institute of the Maritime Fleet/, and the planning and design offices have carried out studies to determine the most progressive types of vessels and the most efficient assignment of these vessels among the shipping lines and routes. Considerable analytic material has been published on the operation of the shipping lines or individual vessel types, and accounting and reporting forms have been developed for scheduled and special-purpose fleet operation. Much has been done in organizing scheduled operation on the international lines. All this has had generally positive results. During the 1976-1979 period, thanks to

improved fleet composition, use on certain lines of special-purpose vessels such as the roll-on, roll-off carriers and containerships, change of loading and unloading operation technology, and primarily thanks to containerization and packetization of part of the cargo flow, the volume of shipments on the lines has risen in the coastal service by nearly 20% and in the international service by 14.2%.

At the same time there are still many deficiencies and unutilized reserves in operation of the scheduled fleet. There are often delays in arrival of the ships in the ports (the primary index of scheduled service) in both coastal and international shipping operations. It would seem that nothing would be simpler than to organize the operation of vessels on a well-defined schedule on the Nakhodka-Magadan line. Here everything that is needed for such organization is in the hands of a single manager--the Far East Shipping Company. But the line is systematically "behind schedule," and only because of the fact that in the shipping company there is not yet a well worked out system and schedule discipline is unsatisfactory.

The use of containerization, and also the use of equipment such as roll-on trailers' piggy-back trailers, and so on is having a serious influence on the financial aspects of scheduled fleet operation.

This question becomes more important each year, since the volume of containerized shipments is increasing each year, and at the same time the number of containers and various sorts of equipment utilized by the shipping companies is increasing.

Unfortunately, many questions associated with the growth of containerization and packetization have not yet been resolved by our industry. UEFIp /Administration for Operation of the Fleet and Ports/, PVFU /expansion unknown/, and SMNIIP /expansion unknown/ should accelerate the issuance of documents such as "Directive on the Planning of International Cargo Shipments in Containers," "Rules for the Shipment of Containerized Cargo by Maritime Transport," and "Agreement with the Ministry of Foreign Trade and the Ministry of Railroads on the Shipment of Transit Containers." Rates for 1981 which will stimulate further growth of containerized shipments should be refined and coordinated with the interested organizations.

The automated management system division and SMNIIP need to accelerate the development and introduction of an automated system for monitoring container traffic.

The problem of container repair organization is becoming particularly important in the USSR. The Ministry should study this problem in detail in order to resolve it during the coming Five Year Plan. Considering the growth of the container fleet, neglect of this question may lead to serious consequences. Finally, we need to determine in the very near future the structure for control of container shipments at all levels of the industry and in coordination with the allied transportation modes, the Ministry of Foreign Trade, GKES, Gosnab SSSR, and other concerned organizations.

Introduction into operation of the Abakan container plant, addition during the coming five-year plan of primarily special-purpose ships to our fleet, and further development of the container terminals in the country require rapid solution of these management and organizational problems.

Several years ago our experience in organizing fleet operations in scheduled coastal shipping operations was utilized in organizing shipments between the ports of the Soviet Union and Cuba. A group of vessels was assigned to the Leningrad-Havana route, standard cargo plans for each vessel type were agreed upon, the berthing time for the ports was determined with account for the progressive technology being used, and a schedule was prepared for each vessel. This organization of fleet and port operation yielded positive results, primarily thanks to regularization of the fleet traffic, improved cargo loading and storage, up-to-date information, improved communications between the ship crews and the port workers. In the first years of operation the overall fleet handling rate increased and the round-trip duration decreased. The overall vessel handling rate increased by 19.3% in 1979 in comparison with 1978, which made it possible to schedule reduction of the round-trip time by 10-12% in 1980.

In 1979 70.7% of the overall shipment volume on this route was carried on vessels operating on a schedule. This mode of fleet operation can and should be used on other routes, such as those between the Black Sea and Guinea, between the ports of the Far East and Japan, and many others.

However the operating personnel of the Baltic and Black Sea shipping companies need to do much more to improve the operation of the fleet on the Cuba route. First of all it is necessary to minimize failure to adhere to scheduled operation of the ships, resolve with the Leningrad port the problem of vessel loading strictly in accordance with the agreed upon standard cargo plan, change over in 1980-1981 to preparation of the documentation in Spanish, improve the information situation with account for the steps taken in this direction together with the Cuban personnel so as to switch over to providing the information with the aid of the automated data management system by 1982. GKbO should continue to work with the foreign trade organizations toward combining shipments and reducing the number of bills of lading (today this number reaches 1000 or more bills of lading per vessel), and also assist the shipping companies in developing packetization and containerization of the cargo flow. Efficient organization of vessel operation on specific routes and on schedule will make it possible to raise fleet utilization effectiveness--this is clearly confirmed by the experience of the Baltic shipping operation, where more than 80% of the fleet operates on regular routes and on a schedule. As a result the shipping organization work force reaches the basic planning goals more consistently from year to year, and from quarter to quarter, from month to month in comparison with the other shipping organizations.

There are significant reserves for increasing the effectiveness of fleet utilization at the ports. Unfortunately, in recent years the goals with

respect to increased overall handling capacity have not been reached by most of the ports because of deficiencies in organizing the cargo handling operations and implementation of the technological discipline, shortage of port workers, inadequate communication with the allied transport modes, primarily with railroad transport.

While developing in 1971 ways to convert the personnel of the Odessa port to operation in the optimal regime, the Board of Directors /of MOP/ approved several significant measures for converting the port to operation in the optimal regime as these measures were carried out and the assigned capital investments were utilized. Calculations showed that with account for the cargo traffic volume and the types of vessels calling at Odessa the optimal number of hatches on the vessel being worked at the same time should reach 3.6 by 1976. However, in actuality 2.6 hatches were worked simultaneously in 1976, 2.7 in 1977, 2.8 in 1978 and 2.6 in 1979.

Were the Board's decisions carried out? They were carried out, but only in respect to the measures aiding the port. The port management did not perform the tasks assigned to them. This situation arose only because of the fact that the port systematically attempted to handle simultaneously a larger number of vessels than the available manpower and material resources could support. While creating the appearance that all was going well, in reality the port wasted its manpower, violating the basic principles of optimization, and in the final analysis the fleet suffered large losses. This situation is also observed in other ports. Unfortunately, in some cases the shipping companies and GKHO even attempt to justify the actions of the operating personnel. This cannot be tolerated. We developed the basic principles of vessel handling in the optimal regime on the basis of careful and thorough study of theory and practice, and these principles were extensively discussed in the shipping companies, GKHO, and the Ministry. Why should anyone now deviate from these principles? This attitude must be changed. From initiation of the vessel handling plan to termination of the cargo handling operations all the subdivisions of the port should be oriented toward optimization of each operation; we need to tighten up inspection and supervision and examine systematically the optimization questions in the shipping company councils and GKHO. The more rapid growth of cargo traffic in comparison with the available capital investments has already created serious disproportion between the technical capabilities of the ports and the requirements of the national economy. One of the consequences of this is the systematic increase in vessel delays in recent years while awaiting handling and the associated losses.

Therefore, today more than ever, the port workers and the scientific planning personnel are faced with the problem of intensifying the trans-shipment process through utilization of the internal reserves for increasing labor productivity and more rational utilization of the available primary funds and manpower resources.

Improved labor productivity in the ports depends in large degree on the level of integrated mechanization of general cargo trans-shipment, which has

increased significantly in recent years because of the entry into operation of vessels of fundamentally new types and high-productivity transshipping facilities and mechanisms, thanks to containerization and packetization.

Much has also been accomplished in introducing progressive technology in the loading and unloading operations, but here in particular there are still considerable reserves, associated primarily with deficiencies in organization and the introduction of advanced work methods.

Labor productivity at the various ports in the Soviet Union often differs markedly when handling the same cargoes and under approximately the same conditions. Thus, when transshipping citrus in the Kherson, Odessa, and Ventpils ports productivity of 128-153 tons per shift with a crew of 13-14 workers has been achieved thanks to the introduction of pallets of increased size and use in the railroad car of hydraulic roller conveyors. At the same time the productivity in the port of Kaliningrad is only 80 tons per shift, and the productivity in Vladivostok is even lower. Another example is the handling of meat in carcass form. At Novorossiisk the processing line productivity is 72-89 tons per shift and at Kherson the figure is 70-80 tons per shift with a crew of 13-15 workers (thanks to the use of a special pallet-scoop with removable sides), while at Leningrad, Kaliningrad, and Magadan the productivity is only 46-57 tons a shift.

At the Leningrad port the productivity of the raw sugar handling line is 170 tons per shift, while at the Kaliningrad port the productivity is 362 tons per shift. And this in ports of the same shipping organization!

These examples indicate large unutilized reserves, realization of which requires organizational measures, study and introduction of the advanced experience and progressive technology achieved in other ports.

Psychological and material incentives for the outstanding workers are of great importance. The best workers and technologists and their experience should be publicized in the press and on the radio. We cannot examine the questions of cargo operation technology apart from the individuals introducing this technology, i.e., the port workers. During the last 8-10 years the level of their professional preparation and their overall educational level have increased tremendously. More than 60% of the port workers are experienced in two or three or more specialities (crane operators, truck drivers, lift-truck operators, and so on). The level of preparation of the brigade leaders has increased considerably; many have an intermediate technical education.

The increased specialized and general educational level of the port workers has made it possible to change over to new forms of brigade work organization, and take the step from small teams with narrow labor specialization to consolidated economically-efficient integrated brigades, capable of performing a wide range of loading and unloading operations combining the functions of the cargo handlers and the mechanized equipment operators, and with payment based on a unified pay scale.

As the forms of labor organization have changed cargo handling technology has also changed, but it is here that all is not yet well with us, this technology has become a bottleneck, retarding labor productivity growth in the consolidated integrated brigades. The study of these problems and the preparation of specific recommendations on elimination of the bottlenecks is a matter for both the practical experts in the field and our scientific research institutes and planning bureaus. This is particularly important because of the fact that during the coming five-year plan the emphasis in this industry will be on further development and improvement of the consolidated integrated brigades, and it appears that preference will be given to the brigades which are specialized on particular cargoes and provide around-the-clock handling of the vessels without interruption of the trans-shipment process. Experience shows that it is precisely in such brigades that the best results are obtained in reducing overall vessel berthing time.

In the primary task of the port--trans-shipment of cargo from one transport mode to another and delivery of the cargo in the shortest possible time to the destination--the introduction and improvement of the experience of the Leningrad transport center (which has been approved by the CPSU Central Committee) is taking on more and more importance.

Unfortunately the introduction of the first stage--solution of problems of informational nature and on their basis generation of planning solutions such as, for example, coordination of the time of arrival of vehicles of the various transport modes on the basis of shipment route, cargo type, transport equipment form and type--is still proceeding with difficulty. Reduction of cargo delivery time by means of direct trans-shipment cargo shipments consolidation, and the creation of conditions for optimal organization of transport equipment servicing is proceeding slowly. The situation is particularly unfavorable in the Vladivostok, Batumi, Arkhangel'sk, and Izmail'sk transport centers. Definite difficulties arise because of different locations of the shipping organizations and the railroad headquarters. But here again ways and forms for efficient interaction of the maritime fleet and railroad transport subdivisions can be and will be found.

The primary factor delaying introduction of the unified continuous planning system and the unified transport centers management system is the fact that each transport mode has developed independently over a long time period and has its own unique performance indexes. We need only say that at the railroad transport headquarters all other transport modes are termed "clientele." How can a unified transport network be constructed in this case? It is possible that at one time such a definition was justified. But at the present time, when maritime transport has developed significantly and on certain routes occupies a dominant position (cargo delivery to the Arctic and the regions of the Far North, Soviet foreign trade cargo shipments) this definition does not meet the needs for the development of a unified nationwide transport system.

Improved operation of the transport centers and their development will contribute to the resolution of several important production and social problems, and also of problems of psychological nature.

We need to solve such basic problems as integrated development of the transport center material and technical base and cultural and social facilities, we also need to develop unified criteria for evaluating transport worker labor and on this basis re-examine the wage rate system and the incentive programs.

These problems should be considered in the plans of the transport ministries for 1981-1985 with the aid of Gosplan SSSR /State Planning Committee USSR/ and Goskomtrud SSSR /State Committee for Labor and Social Problems USSR/.

With the expansion of maritime transport and increased complication of its tasks involved with serving the needs of the national economy and of foreign trade of the nation, with broadening of the field of application of new automation techniques and equipment the role of personnel theoretical and practical preparation and retraining is increasing. Much is being done in this regard. Effective and timely steps in this direction have been the organization at OIIMF /Odessa Institute of Engineers of the Maritime Fleet/ of a Maritime Transport Management Department, several changes introduced in the educational programs, in which major emphasis is being put on study of the economic, commercial, and management disciplines. This is already yielding positive results. However, much remains to be done in this direction.

It appears that the time has come for more detailed examination of the organization of engineering and technical staff retraining at its various levels. At the present time skill upgrading courses are presented at OIIMF and DVVIMU /expansion unknown/. These courses are intended for retaining of specialists who already have advanced degrees and last two months. Work leaves can be obtained to attend the courses.

Experience shows that these courses are usually taken by senior engineers and other engineers, including specialists who have only recently finished their institute education; their theoretical knowledge is fresh in their minds but they have very little practical experience: it may not be wise to rush them into such courses. At the same time there are in these courses very few specialists with extensive industry experience, division and service directors, deputy directors of the shipping organizations and ports, and port directors. The reasons are in all probability quite simple; they lie primarily in the organization of the courses and secondarily in the preparation programs.

We believe that it is necessary to immediately re-examine the existing situation and emphasize the training of management personnel with leaves of absence from their work. It is clear that a unified department of this sort should be created at OIIMF and that outstanding scientists, economists, sociologists, psychologists, and managers of the Ministry and GKHO should be invited to present individual lectures. This department should become in effect a center of all that is new and progressive, a center for interchange and dissemination to the industries of the latest advances in fleet and port operation, in the transport system of the nation and abroad.

These capabilities are available in the Ministry, only initiative and attention to this very important problem are needed. As for retraining of the engineering and technical workers, this should be organized locally in the shipping organizations and ports on the basis of unified programs developed by UUZ /Administration of Educational Institutions/ and carried out both through use of local personnel and with the assistance of invited specialists.

A tremendous reserve for improving transport operational effectiveness lies in the organization of extensive socialistic competition among the maritime fleet teams. When the team is given a clear-cut objective, which is brought to the attention of each employee, and then for realization of this objective specific pledges are made, both collective and individual, the incentive programs are defined, and, finally, in the process of fulfilling this goal specific organizational efforts are exerted by the administration and the Party and trade-union members--success in performance of the plans and achievement of the objectives is assured.

In the fleet the lead role in organizing the socialist competition is assigned to the KhEGS. They are responsible for giving the ship crews all possible assistance in carrying out the socialist pledges which they have made. However, in practice the KhEGS do not involve themselves sufficiently with the problems of socialist competition organization.

What are the reasons for this? On the one hand, there is lack of understanding by part of the management of the KhEGS of the mobilizing force of the socialist competition, and on the other hand there is lack of skill in organizing such a competition. N. Gubanov remarked quite correctly in Pravda on 23 March 1980 that such matters are not taught adequately in our higher schools. It appears that our industry should introduce in the higher maritime and intermediate seaman schools a special course on "Socialist competition, economic support of its organization," based on the experience of the Rostov Party and a course on the theory and practice of socialist competition should be introduced in the curriculum for upgrading the skills of the shipping company managers.

In the present article we have not attempted to discuss all the problems which must be resolved today by the workers of the operational subdivisions, we wished only to touch on the most significant of these problems and in some measure expose them so that the readers might undertake their solution. We believe that the time has also come to hold a major meeting of the industry workers associated with organizing shipments and handling cargos in the ports in order to review the present situation and point out ways to promote practical and theoretical advances in the field of operational activity in maritime transport during the coming five-year plan.

As the first step in this direction, in October 1980 under the sponsorship of the Central Administration of the NTO /Scientific and Technical Society/ of Maritime Transport there will be held an All-Union Conference on: "The

Development and Improvement of Operational Activity in Maritime and River Transport." We request that the ship operators, operational planners, shippers, financial personnel, and scientific personnel send their suggestions on this problem to the organizing committee of the Central Administration of the NTO in order that these suggestions can be taken into consideration in the recommendations developed at the meeting.

More and more teams of workers are making socialist pledges in honor of the coming 26th CPSU Congress; serious problems in these pledges face the transport workers, and we the workers of this industry, utilizing our accumulated experience and skillfully combining this experience with scientific and technical achievements, are obligated to do everything possible to realize these goals.

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